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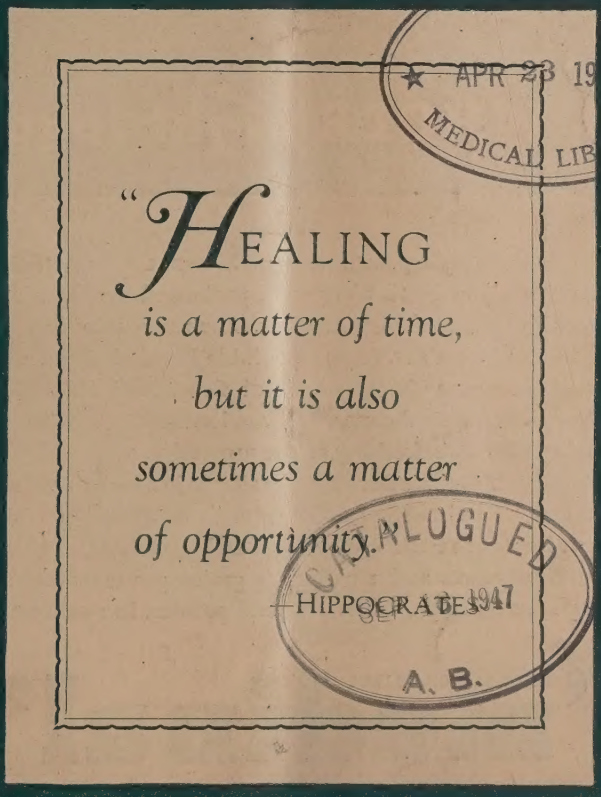

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OPEN FORUM 198

EDITORIALS 231

PAPERS AND ADDRESSES

Penicillin: Demonstration of its Value as a Chemotherapeutic Agent
Sir Howard W. Florey, M.B., F.R.S. and *E. Chain, M.D.*, Oxford, England 217

Penicillin: Its Usefulness, Limitations, Diffusion and Detection, with Analysis of 150 Cases in Which It Was Employed
Wallace E. Herrell, M.D., Donald R. Nichols, M.D., and *Dorothy H. Heilman, M.D.*, Rochester, Minnesota 220

Oxygen Therapy
Ward T. Van Orman, B.S., and *Robert R. Hays, M.D.*, Akron, Ohio 221

Radon and Physical Therapy
Ferdinand Lustig, M.D., New York, N.Y. 225

Lower Back Pain
William Frankman, M.D., Wollaston, Mass. 228

SPECIAL ARTICLE

Evolving the Pattern of Rural Medical Care
T. Swann Harding, Falls Church, Va. 198

OBITUARY

Honourable William Renwick Riddell 232

NEWS ITEMS 233

BOOK REVIEWS 235

MEDICOLEGAL NOTES 236

MISCELLANY 238

VOL. 158, NO. 4
WHOLE NO. 2747

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Temporary Diaphragmatic Paralysis in the Treatment of Tuberculosis

Charles J. Kaufman, Denver (*Rocky Mountain Medical Journal,* February 1945) says that temporary diaphragmatic paralysis, supplemented by pneumoperitoneum, has been found useful in the treatment of pulmonary tuberculosis of the exudative type. He analyzes the results in thirty-seven cases in which the treatment had been used. In this group of patients, who had been in residence in the National Jewish Hospital, Denver, thirteen were excluded from treatment, for various reasons, and in the remaining twenty-four, the x ray findings were predominantly of an exudative nature in all but one, who had a sharply localized fibroulcerative lesion in the right apex. There was some evidence of fibrosis in eleven of the remainder and cavities in ten cases. Six cases were minimal, ten were moderately advanced, and eight were far advanced. In this group of twenty-four patients, twenty-one, or eighty-four percent were benefited to the extent that the sputum became negative by exhaustive examination. X ray examination showed the resolution of infiltrative changes and closure of cavities, and both laboratory and clinical study indicated a subsidence of active inflammatory disease.

The author describes the advantages, disadvantages and hazards of the treatment, pointing out that unaccompanied by full physical and mental rest, the method would probably be of little value. It is his opinion that continuous close supervision over a period of several years is necessary if the benefit obtained from the procedure is not to be lost. When so supervised the timely employment of pneumothorax, thoracoplasty or, perhaps, lobectomy in cases still regarded as probably potentially progressive may serve to insure effective control of the disease with less risk of failure than if the latter procedures had been used initially. He emphasizes that unless used with great care and discrimination artificial pneumothorax is a dangerous treatment, which should never be undertaken without preliminary bronchoscopic examination and should never be instituted before careful consideration has been given to the value of other methods.

The author summarizes his conclusions as follows: Temporary diaphragmatic paralysis supplemented by pneumoperitoneum is a useful method in the treatment of pulmonary tuberculosis with predominantly exudative pathology. The pneumoperitoneum should be maintained with a sufficient quantity of air and under sufficient pressure to stretch the denervated diaphragmatic muscle. The patient should be continuously supervised for several years so that control of the disease may be assured or effective application of other surgical measures may be instituted when the disease would seem to be potentially progressive.

Under certain conditions the establishment of a pneumothorax after recovery of full diaphragmatic muscle tone should be considered. Complete physical and psychological rest is an indispensable part of the treatment until the lesion has been definitely brought under control. Cases of pulmonary tuberculosis that are brought under control by the primary application of this method are in a measure protected against the hazards and other disadvantages of pneumothorax and thoracoplasty.

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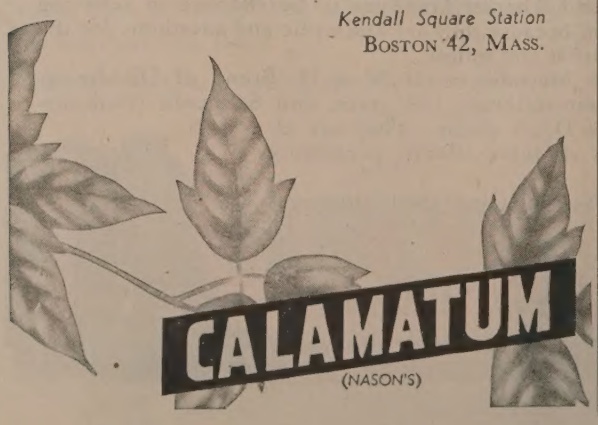

Open Forum

Evolving the Pattern of Rural Medical Care

T. SWANN HARDING
Falls Church, Va.

Both physicians and laymen have long admitted that rural medicine was not what it should be in these United States. Doctors are generally reluctant to settle in rural regions where hospitals and urban medical facilities are less available than in cities. This is partly because they have been educated to practice with such aids right at hand and partly because they know that the financial reward of practice is likely to be better in the city.

In the country distances are great and relative isolation is common. In consequence, though their way of life conduces to health, rural people have been inclined to be somewhat less healthy than city people, as shown by draft rejections. This is in part because they are deprived of good all-around medical care, preventive medicine and sanitation included. In addition it is not uncommon for farm people to eat unwisely and become malnourished even when they have plenty of good food at hand.

It is quite well known that the Farm Security Administration has been sponsoring group medical plans and organizations in many rural communities where it has clients. It was forced to do this after finding that illness and big medical bills retarded or prevented payments from farm families which had received rehabilitation or tenant-purchase loans. FSA has thus found it cannot rehabilitate rural people merely by providing loans, fostering cooperatives, and giving sound advice on farm and home practices.

In all instances where it has fostered a group medical set-up, FSA has worked in close harmony with the local medical societies. As the local physicians discovered that they were now quite likely to be paid to the extent of eighty percent of their billings for much work they formerly did gratis or not at all, and as they compared with this their customary peacetime collections of only forty to sixty percent of their billings, they were eager to cooperate with FSA. Many of them also were glad to cooperate for idealistic and humanitarian reasons as well.

These medical care groups are set up under a system of trusteeship—physicians, hospitals, and dentists being paid a pro rata share of their billings on a fee-for-service basis. However, it is quite natural that FSA should also experiment with other plans of providing rural medical care. For it has always endeavored to tailor its plans to the needs of localities served and it therefore needs to run a wide variety of trial projects.

Some of these experiments have taken county-wide form. There are now several of these, involving two counties in Texas and one each in Georgia, Mississippi, Arkansas, and New Mexico. All of them except the last, involve getting the doctors to cooperate, and trying to induce as many people in the county to join up as possible, all farmers normally being eligible. The counties selected for these experiments are almost entirely rural. Consequently practically all their inhabitants are eligible.

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object to the draining off of individuals whom they regard as able to pay for medical service in the customary manner. It is a fact, however, that group service always proves more economical and efficient than the traditional or horse-and-buggy methods of providing medical care which tradition has saddled on us. It can also be quite as humanitarian in the right hands. Medically, group practice is very effective, because full use is made of equipment and personnel to bring the entire science of medicine to the patient's aid.

In some of the FSA counties nonrural people are now begging for the same medical coverage rural people get. Extension of care to rural people not already its clients is alone a departure from FSA's customary procedure. But its groups are now beginning to accept nonrural people as members. Naturally medical care has had to be subsidized in the experimental counties, both because the people are poor and because the projects are themselves really scientific experiments.

In one of the counties complete medical care is being provided at about $60 per family per year. This means about $12 per individual, as farm families are large. Originally members were asked to contribute only six percent of their net income, or a minimum of $5 per family a year. The actual average was $6.42, and during the second year the minimum was raised to $12. Now it is $18. Dentists are paid in full, hospitals are paid nearly in full, and the doctors get eighty percent of what they bill.

This brings us to Taos County, New Mexico. The FSA experiment here is unique in two respects. For one the county-wide group medical plan has been evolved around well-equipped clinics and subclinics, so located as to give good geographical coverage. For another, the entire staff of the health association—doctors, dentists, nurses, and nonprofessional help—is salaried. Needless to say the entire county is essentially rural, Taos village being the largest settlement.

How did Taos County come to be selected for the organization of the Taos County Cooperative Health Association? The facts that it was wholly rural and that it happened to be well supplied with hospitals for a rural community considerably influenced the decision. Also the Extension Division of the University of New Mexico had made a considerable grant to carry on an over-all county-planning project in Taos County, and better medical care was one thing needed urgently. But the inhabitants had also manifested a desire for better medical care, aware as they were that over sixty percent of them lived and died without ever seeing a doctor, and that their infant mortality, tuberculosis, malnutrition, and other disease rates were very high.

The county is inhabited in the main by Spanish-Americans, who form 96 percent of the population. The remainder divides equally between Indians and Anglo-Americans, with the latter dominating the county's business and professional life. Taos itself has long been a center for artists, writers, and certain wealthy individuals who enjoy its reputed quaintness. There is an Indian Service hospital, the Thomas P. Martin, in Taos Pueblo, a Presbyterian hospital just south of the county, at Embudo, and the Holy Cross Catholic hospital also in Taos.

The last, originally built by a wealthy woman as a home for a prominent woman novelist who never came there to live, was remodeled and equipped as a hospital by contributions from the people of Taos in the 1930's.

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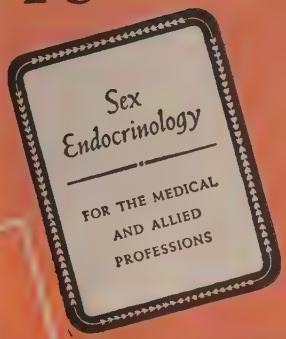

CONTENTS

CHAPTER ONE INTRODUCTION TO ENDOCRINOLOGY	PAGE 7
CHAPTER TWO CHEMISTRY OF THE SEX HORMONES	PAGE 11
CHAPTER THREE HISTORY OF SEX ENDOCRINOLOGY	PAGE 17
CHAPTER FOUR SEX FUNCTION AND SEX ANATOMY	PAGE 23
CHAPTER FIVE CONTROL OF THE SEX HORMONES	PAGE 31
CHAPTER SIX THE ESTROGENIC HORMONE	PAGE 33
CHAPTER SEVEN ESTROGENIC HORMONE THERAPY	PAGE 40
CHAPTER EIGHT THE CORPUS LUTEUM HORMONE	PAGE 51
CHAPTER NINE CORPUS LUTEUM HORMONE THERAPY	PAGE 55
CHAPTER TEN THE MALE SEX HORMONE	PAGE 60
CHAPTER ELEVEN MALE SEX HORMONE THERAPY	PAGE 65
CHAPTER TWELVE THE GONADOTROPINS	PAGE 75
CHAPTER THIRTEEN GONADOTROPIC HORMONE THERAPY	PAGE 80
PACKAGE INFORMATION	PAGE 84
INDEX	PAGE 86

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As the town and the county could not sustain the institution thereafter a Catholic sisterhood took over and has operated the hospital since. Meanwhile the people of the county appealed to the State university and other State agencies for better medical care.

As a result the University of New Mexico instituted special study of the community. Eventually an unincorporated health association was formed and eight hundred families promptly sought to join it. Several agencies and institutions were solicited for financial assistance, FSA among them. Ultimately FSA decided to put in a grant to foster a county-wide experiment in group health and the association was the result. This has grown now till it has more than six thousand members and dependents out of the county's population of fourteen thousand—normally eighteen thousand.

The association maintains its administrative office and its main clinic in rented quarters in Taos. It has transformed a cheaply purchased but very excellent home in Questa into a branch clinic and home for the nurse. It has built a small clinic, now already outgrown, with nurses' living quarters, in Penasco. There are also two subbranch clinics, open a part day weekly with doctor and nurse in attendance, elsewhere in the county. The association has three station wagons in constant use for transportation and as ambulances.

The staff consists of a medical director, two Mexican interns who can practice only under a qualified medical doctor, a part-time physician, a full-time and a referral dentist, four nurses and their capable supervisor, a clerk or so, and a handyman who also drums up membership. The Catholic church also aids ably in membership drives. There is a tie-up with the Proctor Eye Clinic in Taos, and several Santa Fé and Albuquerque specialists are consulted when needed.

The association therefore provides for its members medical care, surgery, hospitalization (by contractual arrangements with existing hospitals), emergency dentistry (extractions and fillings of teeth which are impairing general health), nursing, and specialist consultation. This service is being extended at a rate of about $72 per family, or something like $12.50 to $14.00 per individual, which is extremely low priced.

There has been little or no conflict with the professional men of the county. The association's medical director is an elderly (too elderly, overworked, and, in view of his two coronary attacks, too poor a risk for all this work to depend upon him as it now does) physician of Taos. His salary of $5,200 is above average for rural doctor's incomes, but he more than earns it, as his services never end. The part-time physician gets $3,000, and is in private practice the rest of his time.

The nurses earn less here than they could elsewhere, but the nature of the venture and the opportunities for service add tang to the job and they are eager, enthusiastic, and willing. Kindly humanitarianism pervades every function of the association; each patient is treated as a distinct individual; there is no regimentation, no routine mass examination or treatment. Each member of the staff serves far beyond any narrowly limited requirements.

In a sense the association has tended to drain medical facilities and care away from persons who can pay and towards the poverty-stricken bare-subsistence farmers of Taos (two thirds of the families have cash incomes of less than $250 a year). But that is because the county never had medical equipment or personnel

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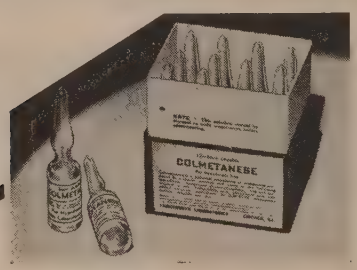

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sufficient to provide adequate care for all of its people all the time. Furthermore, the county's doctors were formerly all grouped in Taos. Nevertheless, not even an income ceiling of $1,800 (it has been first $1,200, then $1,500) for joining the association would draw many patients from the private practitioners of Taos.

Only one physician is hostile to the association. The druggists of Taos did raise objection to the association providing drugs for its patients, which it does as part of the service. Though this objection was unwarranted, as the druggists had never sold pharmaceuticals to these people anyway, the association placated them by routing a portion of the prescriptions through their stores.

The compassion and devotion manifested by the staff make the service unusually good. Insofar as they can, all of them spread the principles of good sanitation, scientific nutrition, and preventive medicine among the people as they go. Just because medical therapy makes so many demands, the staff feels it has not done as much in the way of lay education as it should have. For a while nursing supervision also was neglected, but this lack has now been made good.

The association originally neglected to set high enough salaries to attract better grade professional men when doctors and dentists were more available than during war. The clinic buildings had to be erected under wartime conditions of high costs and scarce labor. The association also needs a maintenance supervisor to cope with breakdowns in its somewhat antique automotive equipment. *Above all, it needs another young, vigorous, idealistic, full-time medical doctor.* For if the medical director collapsed, the Mexican interns could no longer practice, and a disastrous situation would result.

For here we have six or seven thousand people depending upon the Taos County Cooperative Health Association for medical care. This is at present made possible by Government grants which, in monetary terms, mean that we actually expend about $7 a year on the life and health of these native-born Americans. At the same time a valuable pattern for providing rural medical care is being evolved experimentally.

It is most important that the experiment suffer no premature termination. True, an agency like FSA, which has always been under fire and has frequently faced extinction, cannot plan very connectedly or look very far ahead. Certainly it could not guarantee a five-year grant, when its own financial affairs proceed only year to year as Congress disposes. Yet this experiment should have a grant of that length and in larger amount than the present $50,000, if it is to be fully successful. The total budget is $72,000 this fiscal year.

It is unlikely that the people of Taos County can for a very long time fully finance their own medical care, even under an economical and efficient group plan. Their incomes would have to go up a great deal before that became possible. However, starting out by paying only six or seven percent of the total cost, their contributions now amount to approximately twenty-five percent of it. As their superstitions and suspicions are conquered, their incomes increase, and more of them join up, unit costs of operation will decline and the percentage paid by the people should rise.

True these people are unique, but so are the people of every other American locality if we but examine them closely. The Spanish-Americans of Taos are cul-

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turally primitive. Their social organization is patriarchal. But they are slow to change, are superstitious, and many of them greatly fear doctors and hospitals.

However, most rural people have accepted group medical services when available. More often they organize to provide these services for themselves. They tend to be more communal and more readily cooperative than city people. If it is medical care, they care less how it is supplied than how effective and readily available it is.

Here in Taos are people who have lived submarginally for three hundred years. They have eaten a diet deficient in good protein, as well as often in vitamins and minerals. They tend to be dwarfed and physically puny. They have lacked sanitary water supplies, sanitary privies, fly screens. Their infant mortality rate has been 107 per 1,000 live births (as compared with 47 per 1,000 for the country as a whole), traceable mainly to diarrhea and enteritis. A third of their children die before reaching the age of eighteen.

Obviously welfare agencies and institutions for the chronically ill and the tuberculous must carry a heavy burden in such a community. Yet the physical stamina, the disease resistance, and the earning capacity of the people can be improved enormously by proper medical and dental care, and accompanying instruction in sanitation and nutrition. Consequently the FSA grants are in reality investments.

Not only do they pay for sound scientific experimentation in developing a pattern of rural medical care, they save the State and its people money they would have to expend caring for economic failures and the physically incompetent among the inhabitants. Indeed welfare service should contribute to this health project, and, in fact, it is a wonder the experiment has not been taken over by some national institution to use as a nation-wide demonstration.

Meanwhile it goes on day to day, depending upon the continued health of the seventy-four-year-old medical director and the fortunes of the Farm Security Administration. That it is performing a humanitarian and economic as well as a valuable medical service, there can be no doubt.

As State FSA Supervisor Glen Grisham expresses it also: "The native New Mexican must be definitely and unmistakably recognized neither as a peon to be exploited by firmly entrenched economic czars, nor as a part of the local color, to be preserved in quaint, picturesque poverty for the tourist business. He is rather an adult human being, with a congenital right to full participation in the national life, who can make a valuable and unique contribution to the culture of this region."

Germless Island

It is said that the northern island of Novaya Zemlya is germless. Microbes are not found there. Even wild game shot by hunters is germ-free. Sterile dishes with an agar-agar jelly especially suitable for bacterial growth were left outdoors for hours at a stretch, but on incubation no germs appeared. Such a dish would grow germ colonies profusely if exposed to city air for fifteen minutes. Fresh, juicy meat could be left outdoors in an open glass jar, exposed to the elements, but after eight months no trace of rotting could be found. The meat was as fresh as when originally put into the jar. Seems like a great place to live, if you don't mind the cold, isolation and other disadvantages.

GREAT TRIUMPHS IN VITAMIN RESEARCH

This is one of a series of historical notes, highlighting important achievements in Vitamin Research. Illustration is from unretouched photo-micrograph taken in 1944.

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Early Operations in Appendicitis

To the Editor.—

In the January issue of the MEDICAL RECORD, page 22, there is related by William Renwick Riddell, of Toronto, a story about Sir William Osler that interested me very much.

The author refers to a symposium on appendicitis, held in Ontario, in which, during the discussion, the statement was made that the removal of the appendix was safe when the patient was an infant. I am quite sure that this reference to the early removal of the appendix came from a discussion that my old master, the late Dr. Joseph Price, made during that meeting. At that time the medical profession waited until an abscess had formed and then incision and drainage were about all that was performed. Dr. Price took the floor and said that abdominal surgery had advanced to the stage that if the appendix was removed when the cord was tied, the death-rate over the country would be lower than it was at that date with late and inferior surgery.

Of course Dr. Price did not advocate such radical teaching, but the newspapers quoted him as doing so, and he related the following incident to me. When he returned to his office from the Canadian meeting, the first person to come to his office was a lady from the Pennsylvania Main Line. She was holding in her hand the *Philadelphia Press* which contained an article relating to his views about the removal of the baby's appendix. The lady said: "Dr. Price, I see from this morning's *Press* that you are advocating removal of the appendix as soon as the baby is born, and as I have four little children at home who have their appendices, I am very unhappy." Doctor Price said: "Madam, I have seven little children in my home and they all have their appendices", which ended the consultation.

In discussing the early history of the surgical treatment of appendicitis in America, I have related this incident a number of times to show how very early in the history of appendicitis Dr. Price had advocated early operation before there was any pus formation or peritonitis.

Before the classical paper of Fitz of Boston, in 1886, which is given credit for early operation in appendicitis, Dr. Price had performed hundreds of operations for appendicitis, beginning his work in 1878.

No American should write about appendicitis without giving Dr. Joseph Price credit for his early and masterful work in appendicitis and its peritonitic complications. He has had no equal.

J. W. KENNEDY, M.D.
Philadelphia, Pa.

Women Medical Officers

Seventy-four women medical officers now serve in the Army, according to the Office of the Surgeon General. Of this number four are majors, thirty-six are captains and thirty-four are first lieutenants. They have been certified as internists, neuropsychiatrists, obstetricians, gynecologists, pathologists, radiologists and anesthetists, and the Army has given them assignments in line with their specialties at general, regional and station hospitals as well as at the two WAC training centers. Seventeen of these women medical officers are now serving overseas.

A STRIP of bandage fluttering from a rifle stock . . . That's the battlefield marker of a wounded soldier . . . that's the Army doctor's *call to action!*

On battlefields thousands of miles from home, the military medical man is proving himself every inch a fighting man. And like the man with the gun, his rest is often limited to a few moments of relaxation . . . a cigarette. More than likely it's a Camel cigarette, for Camels are such a big favorite with fighting men in all the services.

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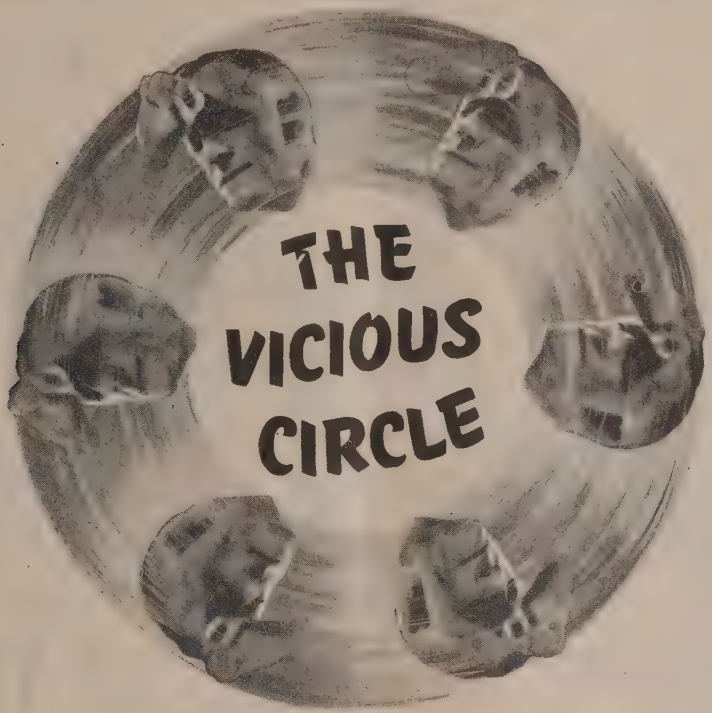

IN THE TREATMENT of essential hypertension, physicians frequently are confronted with a vicious circle.

Many patients suffering from essential hypertension are much concerned with the level of the blood pressure, and are greatly affected by the subjective symptoms. The resulting anxiety and apprehension may periodically elevate the blood pressure to higher levels. This in turn may exacerbate the subjective symptoms—and so the *vicious circle* maintains or accelerates its momentum.

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New Synthesis of Histidine

A new synthesis of histidine, an amino acid occuring in relatively large quantities in blood corpuscle paste, has been developed in the laboratories of the Winthrop Chemical Company, Inc., Rensselaer, N.Y., by Drs. N. F. Albertson and S. Archer, who describe details in a scientific paper to appear shortly in the *Journal of the American Chemical Society*. The same paper will present new methods for the preparation of leucine, amino-isocaproic acid, formed by the digestion of protein and found normally in the spleen and pancreas, and phenylalanine, another constituent of the protein molecule. It is stated that the present method for synthesizing this amino acid, known as the Pyman method, has not been employed to any great extent because of the difficulties involved in some of the steps as well as the large number of steps required. According to the authors, the new synthesis employs fruit sugar as a starting material, and converts the sugar to histidine in a series of four steps.

Medical History of World War II

According to a report from Colonel Albert G. Love, historian of the Army Medical Department, plans have been made to complete the medical history of the second World War six months after victory in the Pacific. Several officers are now assigned to the historical program, approximately half of them serving in overseas theatres. Most of these officers hold graduate degrees in history from leading universities throughout the country. They were commissioned in the Medical Administrative Corps following completion of training in Officer Candidate Schools. These officers are working on the administrative aspects of the medical service including supply, personnel, training, and hospital construc'ion. The professional medical experience of the Army will be recorded by medical officers especially qualified in various specialties.

By means of this well-manned staff, the history of the Medical Department in the current conflict should be completed within the time limit set by Colonel Love. Previous histories published by the Medical Department appeared several years after the cessation of hostilities. Twenty-three years were required to complete the medical history of the Civil War; ten years to complete that of the first World War. Early publication of the current history will be advantageous in that many of the administrative and scientific advances in military medicine will be applicable in planning for national defense and civilian practice. Thus the things which the Army is learning today on the World's battle fronts—improved methods of collection and evacuation of the wounded with prompt treatment, better medical and surgical care, the use of new drugs and appliances, control of communicable diseases, advances in reconditioning—are destined to reach public domain while the knowledge acquired by the Army is still fresh.

At a meeting of historical officers held in the Office of the Surgeon General on December 6th, announcement was made that sufficient volumes would be published to cover the entire scope of the Medical Department's professional and administrative work. Material for the series of volumes is rapidly accumulating from installations in this country and overseas. Colonel George R. Callender, director of the Army Medical School, stated that excellent reports on missile casualties have been received for the volume on wound ballistics covering several campaigns.

The series of volumes gives promise of being the most complete and revealing chronicle of military medical advances ever compiled. The Surgeon General and other authorities in the War Department are lending full support to the historical project.

Scholarships for Physical Therapists

The National Foundation for Infantile Paralysis has appropriated $1,267,600 for the training of physical therapists, as a critical shortage of these vitally needed specialists endangers the proper care of infantile paralysis victims. In making this announcement, Basil O'Connor, president of the Foundation, said that present day medical treatment of patients with infantile paralysis demanded more and more physical therapy. A physical therapist was, he said, a technician who used physical agents such as heat, electricity, light, exercise, rest, muscle training and similar methods in contrast to the use of drugs, biological and surgical technics. Today there were only two thousand five hundred qualified physical therapists, of whom more than half were in the Armed Forces. With earlier and more extensive use of such methods of treatment, twice the number already trained could be used for this disease alone. It is estimated that an additional five thousand could be used now, not only for the treatment of infantile paralysis, but also for aiding recovery from many other diseases and disabilities.

The $1,267,600 program developed under the guidance of a special committee established in the field of physical therapy consists of three parts: $1,107,000 for scholarships to train new physical therapists; $82,000 for fellowships to provide additional teachers, and $78,600 for general development of the field of physical therapy.

Dr. Irvin Abell, Louisville, Ky., is chairman of the Committee and its membership includes Dr. Donald B. Armstrong, New York; Dr. Max M. Peet, Ann Arbor, Mich.; Dr. Morris Fishbein, Chicago; Dr. Arthur L. Watkins, Boston; Dr. M. G. Westmoreland, Chicago; Miss Jessie Stevenson, New York; Miss Lucille Daniels and three representatives of the National Foundation.

Expanson of Army General Hospitals

The Army's expansion of its hospitals by seventy thousand beds is being accomplished through the conversion of existing buildings on hospital grounds rather than through new construction, according to the Office of the Surgeon General. "At many of the general hospitals", said Brigadier General Raymond W. Bliss, assistant surgeon general, "there are well-constructed barracks, built with an eye to the future, which were used to house overseas hospital units during their training period. These barracks are now being turned into wards for patients. Permanent barracks, built to house the hospital staff, are also being converted into wards and are being replaced with temporary barracks which can be quickly constructed". Over fifty thousand more patients are being cared for in the Army's general hospitals than was the case three months ago. During the preceding month about one thousand, two hundred casualties arrived from overseas daily.

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PENICILLIN: DEMONSTRATION OF ITS VALUE AS A CHEMOTHERAPEUTIC AGENT

Preliminary Report of a New Method

SIR HOWARD W. FLOREY, M.B., F.R.S. and E. CHAIN, M.D.
Oxford, England

As long ago as 1877, Pasteur and Joubert noticed that the growth of certain air-borne organisms inhibited the growth of the anthrax bacillus, and suggested that this fact might be of importance in therapeutics. Since that time, many instances have been found of the production by one microbe or mould of a substance which inhibits the growth of others. These naturally produced antibacterial substances have been called antibiotics. Attempts have been made to utilize antibiotics in medicine, the most noteworthy being that of Emmerich and Loew (1899) who extracted pyocyanase from Pseudomonas pyocyanea, and of Dubos (1939) who extracted gramicidin, a mixture of two polypeptides, from bacillus brevis.

Early Work on Penicillin

In 1929 Fleming described the production of an antibiotic by a mould. A mould spore had settled and developed on an agar plate on which staphylococci were growing. Fleming noticed that the bacteria were dissolving in the vicinity of the mould mycelium, and rightly attributed this phenomenon to the production of an antibacterial substance by the mould. He showed that the mould could be grown on ordinary nutrient broth and that after some days the broth acquired the property of inhibiting the growth of many pathogenic organisms, even when it was diluted as much as eight hundred times. The mould was later identified as Penicillium notatum. Fleming gave the name "penicillin" to the active broth. He demonstrated that it was not more toxic to animals than ordinary broth and that it had no marked effect on human leucocytes. He used it as a local antiseptic on a few indolent wounds and stated that it "certainly appeared to be superior to dressings containing potent chemicals".

Soon after the publications of Fleming's observations, attempts were made by Clutterbuck, Lovell and Raistrick (1932) to extract the active material from the culture medium, but these met with little success. Penicillin proved to be a very elusive substance, which was destroyed during the manipulations applied for its isolation. After the report of the failure of the first attempts to isolate penicillin no further effort was made to introduce it into medicine, though the crude medium was still used to assist in the isolation of bacteria in the laboratory. In view of its great instability it was considered improbable that penicillin would ever be of practical value in medicine. There was no evidence in the first descriptions of the properties of the broth containing penicillin from which one could have justifiably concluded it to contain a unique chemotherapeutic agent of the first importance. It is, indeed, impossible to obtain such evidence on any antibiotic without first extracting it from the crude culture medium (which contains substances noxious to the animal body) in a form sufficiently pure and stable to permit a thorough examination of its pharmacological and chemical properties.

Discovery of the Chemotherapeutic Properties of Penicillin

In 1938 interest in penicillin was revived by the present writers. One of us (H.W.F.) had become interested in 1929 in another antibacterial substance, lysozyme, which had been discovered by Fleming in 1922 and, during the subsequent years, this work was continued with various collaborators till the enzyme was purified by Roberts (1937) and its substrate was characterized (Epstein and Chain, 1940). During the latter part of this work we prepared a plan for the systematic investigation of antibacterial substances produced by microorganisms. It was thought that these might be chemically and biologically interesting, especially as many of them were active against pathogenic bacteria. Among the many antibiotics in the literature penicillin, as described by Fleming and others, attracted our particular attention by combining unusual chemical properties with apparently powerful antibacterial action. The fact that it acted against many pathogenic bacteria, including the staphyloccus, heightened this interest. It had been stated that penicillin-containing culture medium might retain its antibacterial activity unchanged for some weeks under certain conditions. This fact justified the hope that appropriate conditions could be found for its extraction from the culture medium and its purification.

The reinvestigation of penicillin was started as a purely academic problem, without any expectation that it would lead to a discovery of considerable practical importance. It soon became apparent that results

would be achieved most quickly by the cooperative effort of a team of scientists with specialized training. We were particularly fortunate in our collaborators. Dr. N. G. Heatley devised a simple and quick quantitative assay method which has proved invaluable in the elaboration of purification processes for penicillin, and in similar investigations on other antibiotics. He also designed and constructed the first large scale laboratory plant for growing the mould and extracting penicillin. Dr. A. G. Sanders later devised and built alternative apparatus for the extraction of penicillin on a larger scale. Dr. A. D. Gardner, professor of bacteriology at Oxford University, collaborated throughout on the bacteriological aspects of the work. The biological investigations were carried out by one of us (H.W.F.) in collaboration with Dr. M. A. Jennings, the chemical and biochemical investigations by one of us (E.C.) in collaboration with Dr. E. P. Abraham. The therapeutic trials on man were conducted first by Dr. C. M. Fletcher and later by Dr. M. E. Florey, with the help of many physicians and surgeons.

Physical and Chemical Properties of Penicillin (Chain et al., 1940)

It was first established that penicillin was an acid which, as the free acid in aqueous solution, was very unstable, but in the form of alkali and alkaline earth salts was stable between pH 5 and pH 7. Clutterbuck et al. had found that penicillin was extracted into ether on shaking with the culture fluid after it had been acidified. When the ether was evaporated, however, the activity was largely lost. This experiment was confirmed, but it was found possible to prepare stable salts of penicillin by shaking the ether solution with dilute aqueous alkali so as to bring the final pH to 7. In addition to ether, a number of organic solvents, for example chloroform and amyl acetate, could be used to extract the free acid form of penicillin. The salts of penicillin were much more soluble in water than in the organic solvents, and therefore penicillin was removed from the organic solvent by about one-fifth to one-tenth the volume of alkali solution. A concentration of penicillin was thereby achieved, and by repeating the extraction sevaral times with different solvents and at suitable pH, a considerable purification of penicillin and simultaneous reduction of the bulk of liquid was obtained.

The losses of penicillin during these operations were small if the solutions were kept cold throughout. On drying the final aqueous solution *in vacuo* from the frozen state, a preparation of a salt of penicillin was obtained, in powder form, which kept its antibacterial activity unchanged for a long time.

Methods of Purification

Chemically, however, the preparation was far from pure, containing, as is now known, not more than a small percentage of pure penicillin. The isolation of penicillin in the pure state from this mixture proved a difficult problem because of its instability towards many reagents and the unfavourable solubilities of the free acid and its salts (Abraham and Chain, 1942). It was found that penicillin was destroyed by dilute acid and alkali, by heavy metals (in particular zinc, cadmium, copper and mercury), and by primary alcohols, ketonic reagents and oxidising agents. The stable alkali and alkaline earth salts of penicillin were extremely easily soluble in water, and no organic cation forming a relatively insoluble salt with penicillin suitable for purification purposes was found.

The selection for the methods of purification of penicillin was therefore limited to distribution between different solvents and water, and to adsorption methods. Chromatographic methods have been used extensively. In combination with a reduction process with aluminum-amalgam it has been possible by these methods to produce penicillin preparations from which crystalline salts could be made. The purest material obtained at Oxford has an activity of about 1.250 Oxford units per mg., and is capable of inhibiting the growth of certain bacteria at a dilution of about one in fifty million.

Bacteriostatic Properties, Pharmacology, Chemotherapeutic Action in Animals

Once a protein-free preparation containing a stable salt of penicillin was obtained it became possible to examine in detail its biological properties. (Abraham et al., 1941).

For the first biological experiments it is now known that quite crude preparations were used. Their antibacterial properties proved to be the same as those found by Fleming, who used crude penicillin-containing culture fluid. It was noted in addition that Actinomyces bovis and the group of anaerobic organisms causing gas gangrene were sensitive, but unfortunately not the tubercle bacillus.

The following bacteria are sensitive to penicillin: Streptococcus pyogenes; Staphylococcus aureus and albus (a small proportion of strains are naturally insensitive); Streptococcus pneumoniae; Streptococcus viridans (strain variation in sensitivity); Bacillus anthracis; Corynebacterium diphtheriae; Actinomyces bovis; Clostridium tetani; Clostridium welchii; Clostridium septique; Clostridium oedematiens; Neisseria gonorrhoeae, and Neisseria meningitidis.

Recently the following have been added to the list: Spirochaetes of syphilis and relapsing fever, and the virus causing ornithosis.

Penicillin can, of course, be expected to act only in diseases caused by sensitive organisms.

So great was the antibacterial power of even the crudest extracts that at that time—not realizing the extraordinary potency of penicillin—we believed them to be fairly pure. In actual fact we know now that they contained about one percent of pure penicillin. However, on the assumption that they were fairly pure, certain biological investigations were undertaken. It was shown that the extracts were remarkably nontoxic to mice—a twenty gram mouse showed little or no disturbance after injection of ten mg. of the sodium salt. It has since been found that twenty mg. of a much more highly purified extract can be given without any deleterious effects. Not only were the extracts relatively innocuous to the whole animal, but leucocytes and tissue cultures withstood many hundreds of times the concentration needed to inhibit such organisms as the streptococcus. In the light of present knowledge of the gross impurity of the original extracts, one can only be thankful that the mass of impurities, as well as the penicillin, were so little toxic.

Penicillin was readily absorbed in animals after intramuscular or subcutaneous injection, and from the small intestine. It could not of course be given by mouth because the acid of the gastric juice destroyed it, nor by rectum as the bacteria present there inactivated it. It was largely excreted, still in an active form, in the urine of the mouse, rabbit and cat, and to a certain extent in the bile and saliva, though not in the tears or pancreatic juice of the cat. Though penicillin was readily soluble and diffusible, it did not pass in detectable quantities from the blood into the cerebrospinal fluid.

In agreement with Fleming's observations it was found that the action of penicillin was bacteriostatic, in that it merely inhibited the growth of organisms and did not kill them quickly, as did poisonous antiseptics such as proflavine. The respiration of bacteria, as measured in a Warburg-Barcroft apparatus, was not affected by quite strong solutions, in contrast to most antiseptics which, acting on some protoplasmic constituent, rapidly cause the cessation of respiration. This bacteriostatic effect was reflected in the morphological changes undergone by sensitive bacteria when grown in a dilution of penicillin not sufficient to cause complete inhibition of growth. By interference with division giant forms were produced.

Most antibacterial substances, such as ordinary antiseptics and the sulphonamides, are, for one reason or another, not active in the presence of pus, and hence their therapeutic efficacy is severely limited. It was therefore a particularly fortunate property of penicillin that pus, tissue autolysates, blood and serum had little, if any, inhibitory effect on its activity. It was found too that the number of organisms present had little effect on its inhibitory power—again a contrast with the sulphonamides.

In view of this combination of great antibacterial power with low toxicity, it was not altogether surprising that "mouse protection tests" gave a clear demonstration of the chemotherapeutic properties of penicillin. With appropriate dosage almost complete protection was afforded to batches of mice infected intraperitoneally with lethal doses of streptococci and staphylococci and intramuscularly with Clostridium septique.

Early Observation on Human Subjects

It will be seen from this account that a fairly complete knowledge of its properties, both chemical and biological, had been obtained before penicillin was used on man. In terms of the labor involved it was, however, a big step from experiments on mice to making observations on the human subject, for the mould produces very little of the active substance. Months elapsed before enough material could be accumulated to try the first injection on man.

Injection in the human subject disclosed that some substance was present in the crude penicillin preparations which caused a rigor and sharp rise of temperature. This had not been suspected from observations in animals. By good fortune the pyrogenic effect was due not to the penicillin but to an impurity which could be removed.

Insufficient material had been accumulated for the first two cases treated, and although both patients, who were seriously ill, did well for a time, they relapsed and further treatment could not be carried out for lack of material.

In the course of some months enough was accumulated (partly prepared in Oxford and partly in the laboratories of Imperial Chemical Industries) to treat by parenteral injection a further eighteen patients. During the course of these observations it became clear that the behaviour of penicillin in man was no different from its behaviour in mice and cats. Toxic reactions, apart from the pyrogen, were not observed and some striking recoveries of patients infected with staphylococci were obtained. Suitable dosage was worked out and the principles of treatment were formulated. Penicillin was also shown to be valuable for local application in various septic conditions.

Clinical Use

Penicillin may be used clinically in two ways:

1. By parenteral administration, as an intramuscular or intravenous injection, given either in three- or four-hourly doses, or as a continuous drip (e.g., Florey and Florey, 1943). The drug is absorbed into the blood stream and distributed to the whole of the body including the infected part. The kidneys excrete the drug rapidly and hence relatively very large doses have to be given to maintain a bacteriostatic concentration continuously.

2. By local application, in solution, paste or powder (e.g., Florey and Williams, 1944). For this method to be successful there must be complete access to all infected tissue and dead tissue such as sloughs or sequestra must be removed. To reach all infected parts and to maintain the penicillin there continuously frequently calls for surgical ingenuity, and success often entirely depends on the skill and resource of the surgeon. For instance, under appropriate conditions wounds which would otherwise be left open may be sewn up and the penicillin instilled through tubes. Local application by injection is also suitable for infections in the meningeal and serous cavities.

The exploration of methods of application is being vigorously pursued and eventually enough data will be accumulated to formulate definite dosages and methods for treating various diseases. At the same time, with increasing quantities of penicillin it will be possible to treat a greater range of diseases, and perhaps some unexpected successes will be revealed.

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PENICILLIN

*Its Usefulness, Limitations, Diffusion and Detection, with Analysis of 150 Cases in Which It Was Employed**

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Although penicillin is exceedingly effective in the treatment of some infections, it is ineffective against many others. The susceptible and insusceptible organisms are essentially those listed in table 1. As investigation continues, other organisms undoubtedly will be added to the list.

Both the sodium and the calcium salts have been used for local treatment, but the calcium salt is more satisfactory. For local treatment of wounds involving soft tissue and bone and for topical application to infected surfaces, saline solutions containings 250 Oxford units per cubic centimeter are suitable. In the treatment of severe and extensive inflammatory lesions, uniformly satisfactory results are more likely to be obtained by systemic penicillin therapy used alone or with local therapy.

In the treatment of suppurative intrathoracic disease, such as empyema, it is desirable to supplement parenteral therapy with instillation of penicillin into the pleural space. In many instances, empyema thus can be treated satisfactorily without surgical drainage. For this purpose, as a rule, thirty thousand to forty thousand Oxford units in thirty to forty c.c. of isotonic solution of sodium chloride can be instilled directly after thoracentesis. This procedure is carried out once every twenty-four to forty-eight hours.

In cases of acute or subacute suppurative arthritis, fairly adequate antibacterial amounts of penicillin will reach the articular fluid after intramuscular or intravenous administration. In some instances, the concentration of penicillin in the joint fluid is approximately half that in the blood. If it is desirable to supplement systemic therapy in such cases, penicillin can be instilled into the joint without producing any serious effects. The authors have instilled twenty thousand Oxford units of penicillin in ten c.c. of isotonic solution of sodium chloride directly into an infected joint after aspiration has been performed.

Although penicillin diffuses rather readily into most tissues, it does not reach the spinal fluid after intramuscular or intravenous injection. In cases of infection of the cerebrospinal structures it is necessary to administer penicillin by the intrathecal route at least once daily. Systemic penicillin therapy should be supplemented by daily instillations of ten thousand to twenty thousand Oxford units into the spinal canal. This amount of penicillin usually is dissolved in ten c.c. of isotonic solution of sodium chloride. Both the sodium and calcium salts of penicillin have proved satisfactory for this method of administration.

When penicillin is administered intramuscularly, it is administered every three hours in doses of ten thousand to twenty thousand Oxford units in two to four c.c. of isotonic solution of sodium chloride.

The continuous intravenous drip method of administration of penicillin best maintains a constant level in the blood. When penicillin is administered in this manner, eighty thousand Oxford units per day usually will be found sufficient; in many instances, only forty thousand units per day will be necessary. The authors expressed the opinion that one hundred thousand units of penicillin per day is probably the maximal amount necessary for the treatment of the infections most commonly encountered.

Table 1: Antibacterial Action of Penicillin

Susceptible organisms	*Insusceptible organisms*
Diplococcus pneumoniae	Eberthella typhosa
Streptococcus pyogenes	Salmonella paratyphi
Streptococcus salivarius	Salmonella enteritidis
Micro-aerophilic streptococci	Shigella dysenteriae
Staphylococcus aureus	Proteus vulgaris
Staphylococcus albus (some strains)	Pseudomonas aeruginosa (Bacillus pyocyaneus)
Neisseria gonorrhoeae	Pseudomonas fluorescens
Neisseria intracellularis	Serratia marcescens (Bacillus prodigiosus)
Actinomyces bovis	Klebsiella pneumoniae
Bacillus anthracis	Hemophilus influenzae
Bacillus subtilis	Escherichia coli
Clostridium botulinum	Staphylococcus albus (some strains)
Clostridium tetani	Micrococcus albus (some strains)
Clostridium perfringens (welchii)	Monilia albicans
Corynebacterium diphtheriae	Monilia candida
Clostridium septicum	Monilia krusei
Micrococci	Blastomyces
Streptobacillus moniliformis	Mycobacterium tuberculosis
Borrelia novyi (spirochete of relapsing fever)	Streptococcus faecalis
Treponema pallidum	Brucella melitensis
Leptospira icterohaemorrhagiae	Plasmodium vivax
Spirillum minus	Toxoplasma
Psittacosis virus	Vibro comma
Ornithosis virus	

Penicillin is transmitted through the placenta from the mother to the fetus. This has an important bearing on the antepartum treatment of syphilis with penicillin.

Serious toxic reactions have not followed the use of either the sodium or the calcium salt for intrathoracic, intraarticular or intrathecal instillation. Such reactions have not followed the local application or the intramuscular or intravenous administration of penicillin in the doses recommended. Local irritation at the site of injection of either the sodium or the calcium salt of penicillin varies with different batches. Changing the site of administration or changing the product often will terminate this reaction. The only other toxic reaction of any significance is the occurrence of urticaria and irritative dermatitis. The latter reaction is seldom observed. Febrile reactions may occur if the penicillin employed is not pyrogen free.

Fleming's adaptation of the Wright slide-cell technic is the most reliable method of determining the concentration of penicillin in the serum.

*Abstract of an article which appeared in the *Journal of the American Medical Association*, 125:1003-1011 (Aug. 12) 1944.

Of 150 patients who had infections owing to a variety of bacteria, 103 were treated with the sodium salt of penicillin and forty-seven with the calcium salt. The calcium salt is handled more easily and appears to be more stable. Among twenty-eight patients suffering from bacteriemia, most of whom had resisted sulfonamide therapy, twenty-five recovered and three died. At present, eighty thousand units in twenty-four hours appears to be the most satisfactory dose in cases of bacteriemia.

Other bacterial infections for which the authors have used penicillin include bacterial endocarditis, severe cellulitis, postoperative wound infection, osteomyelitis (acute and chronic), gas gangrene, infections of the urinary tract, meningitis, pulmonary suppurative disease and a small group of miscellaneous infections. The results with 107 patients (one of whom was counted twice) could be considered brilliant or satisfactory; doubtful results or failures occurred with forty-four.

The use of penicillin should not be attempted in the treatment of gram-negative bacillary infections, including undulant fever, tularemia, influenza, infections due to the colon-typhoid-dysentery group or infections due to Klebsiella pneumoniae. Infections of the urinary tract due to gram-negative organisms do not respond to penicillin. It has not proved useful in the treatment of tuberculosis, acute rheumatic fever, lupus erythematosus, pemphigus, mononucleosis, leukemia, ulcerative colitis, malaria or blastomycosis.

OXYGEN THERAPY

Preliminary Report of a New Method

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Technique of Oxygen Therapy
By Ward T. Van Orman

The need for oxygen in the human body was first demonstrated in the free balloon flight of Coxwell and Glaisher from Wolverhampton, England, September 5, 1862. Records indicate that at twenty-nine thousand feet Glaisher lost consciousness and Coxwell barely managed to valve enough gas to cause the balloon to descend to the safety of the lower altitudes.

On April 15, 1875, the French balloonists, Tissandier, Sivel and Croce-Spinelli ascended from Paris in the balloon Zenith. They were supplied with 150 liters of oxygen in rubberized containers to counteract the anoxemia encountered at the higher altitudes. Paul Bert, the famous physiologist, declared the amount of oxygen they carried to be woefully inadequate. The craft reached twenty-eight thousand feet where Sivel and Croce-Spinelli lost consciousness and died from the lack of oxygen. Tissandier alone survived. The irony of the flight was that the meager oxygen supply was untouched. Here we record the first fatalities from anoxemia. Paul Bert recognized the need for further research in low pressures and in 1878 his *La Pression Barometrique* appeared which won for him the title of "Father of Aviation Medicine".

The progress of aviation in the last two years has given a tremendous impetus to the application of oxygen. The present human ceiling with one hundred percent oxygen is thirty-eight thousand feet. With positive pressure types of masks, the human ceiling may be lifted to forty-five thousand feet. For higher altitudes there is only one safe method, that is pressurizing the entire body. With this principle any altitude may be achieved in safety and without discomfort. It also follows that in oxygen theropy, pressurizing the entire body will counteract even the more serious cases of anoxemia which are beyond the range of the oxygen tent, mask, or positive pressure mask.

The problems of higher altitudes were in process of solution by the late Dr. George Crile at the time of his death, collaborating with the author. As an outgrowth of the work with Dr. Crile a new technique in oxygen therapy has been made available.

From an engineer's viewpoint, it appears that life is dependent on food, water and air. One may live weeks without food, days without water, but without air death arrives in six to twenty minutes. It naturally follows that wherever anoxemia is present, a logical remedy is to increase the oxygen intake into the blood. Such cases may be pulmonary disorders, carbon monoxide poisoning, other toxics, shock, shortness of breath, substitute for transfusions, heart conditions, asthma, intoxication, and insomnia. In fact, wherever additional oxygen is needed the new method affords a mechanism applying the oxygen under pressure, avoiding the limitations of the oxygen tent, oxygen mask, and positive pressure mask.

In discussing problems of the troposphere and stratosphere with Dr. Robert R. Hays, of Akron, he pointed out that in some of his patients the evidence of anoxia was present as a secondary effect of exposure to toxic fumes. Dr. Hays agreed that an oxygenation cylinder would offer an effective means of combating this anoxemia and suggested a series of test cases.

The oxygenation cylinder (Fig. 1) was originally developed for counteracting certain reaction in stratosphere flying. It is conical shaped with spherical end, seven feet long. A longitudinal opening of five feet is provided by an air tight zipper. Inspection windows four inches in diameter, permit visual observation of the patient and help prevent claustrophobia. A gauge of 0 to five pounds registers the internal pressure and a pressure regulator provides automatic pressure control. It has been found that two pounds pressure above atmospheric is comfortable if the patient swallows frequently to alleviate the effect of pressure changes on the ear drums. Pure oxygen is used and a flow sufficient to carry away the carbon dioxide through purging. The average treatment lasts forty minutes, though some were extended to an hour. The oxygenation cylinder weighs but fourteen pounds and may be wrapped up in a carrying case ten inches in diameter and twenty

inches long. A standard two hundred cubic foot cylinder of oxygen with conventional regulator is recommended.

Cooperating with Dr. Hays I have had the opportunity of witnessing the transition of several of the subjects from listless, silent individuals to vital personalities. These transitions have been much too rapid for any factor of suggestabilitty to color the picture seriously. Also the extent of the improvement was so marked it left no doubt about the permanency of the cure.

Fig. 1.—Oxygenation cylinder.

Attention is directed to the relationship of absorption of oxygen by the blood in the lungs and pressure. The rate of oxygen absorption by the blood in the lungs is directly proportional to the partial pressure of the oxygen in contact with the surface of the lung or the alveolar pressure. With the mask or tent the rate of absorption is limited to essentially atmospheric pressure. In the oxygenation cylinder the rate of absorption may be increased beyond that which is now currently used. Hence we have a new tool for oxygen therapy, impressing oxygen not only on the lungs but on the entire surface of the body under controlled conditions. In the new oxygenation cylinder all one needs to do is to close a zipper and turn on the oxygen supply slowly. About one minute should elapse in bringing the cylinder up to two p.s.i. An automatic control valve maintains the pressure at the desired value. At the conclusion of the treatment one minute should elapse in decreasing the pressure to atmospheric before opening the zipper and removing the patient.

Clinical Findings in the Therapeutic Use of Oxygen
By Robert R. Hays, M.D.

The use of oxygen and mixtures of oxygen and other gases, notably helium and nitrogen, has shown a marked increase during the past few years. During World War I its use as a therapeutic agent was chiefly in the treatment of victims of war gases, and in the treatment of severe pneumonias. However, at this period oxygen was seldom given to pneumonia victims until they were *in extremis*. In the early days of its use as a remedial agent, the expense was quite considerable and possibly was a factor in preventing wider application.

During the past twenty-five years great advances have been made in techniques. Wider spheres of usefulness have been found. Aviation, diving and medicine have benefitted.

The work of the late Dr. Crile, Ward Van Orman and others has benefitted immeasurably the science and art of high altitude flying.

In diving, Hoppe-Seiler, Bucquoz, and Paul Bert pointed to the explanation of caisson disease. Hill explained the action of nitrogen in the form of bubbles in the tissues which are the direct cause of the lesions in caisson disease.

In medicine a host of investigators have been busy. A. H. Smith, of New York, introduced a medical air lock for the Brooklyn Bridge workers. Haldane, Douglas and Henderson made an exhaustive study of altitude sickness and anoxemia. Their studies were made on Pikes Peak. They pointed out the process of acclimatization. In this phenomenon the alveolar CO_2 dropped from 40 to 27 mm pressure. There was also a marked increase in hemoglobin and red cells. This amounted to one hundred and twenty to one hundred and fifty percent increase.

The use of oxygen in treating poisoning by industrial gases, such as carbon monoxide, carbon bisulphide, benzol and naphtha solvent (a mixture of crude benzene, toluene, and xylene), has been common and well recognized. Its use in the treatment of diseases has also been well studied. Pneumonia, bronchial asthma, acute bronchiolitis, emphysema, pulmonary fibrosis, laryngospasm, severe pulmonary edema, etc., have shown good response. It has been used in certain obstructive lesions of the tracheobronchial tree since it is thinner than air and flows more readily through a narrowed orifice.

For some time I have been observing a form of illness among the rubber workers which has been alarmingly on the increase since the recent advent of synthetics. Its cause is, without doubt, the inhalation of toxic substances. These are—to mention a few of which we know—carbon tetrachloride, benzol, naphtha, carbon bisulphide, di-methyl ketone, alcohol, etc.

The symptoms are, to enumerate the outstanding ones, nausea, vomiting, dizziness and weakness, with the mental findings of confusion, loss of memory for recent events, occasionally also for remote events, difficulty in making arithmetical calculations, emotional depression, vague and ill defined fears, with definite delusional trends which range from ideas of hopelessness and despair to poorly systematized ideas of a paranoid character. Delusions of infidelity are rather common. The patients are unfit for work.

In November, 1943, I visited the Philadelphia Institute for Research to find, if possible, some form of treatment. Dr. Ziegler, the chemist, ventured the opinion that the basic difficulty was a partial loss of oxygen combining power of the blood due to the fact that the toxic substances formed compounds with the hemoglobin. He suggested long periods of vacation away from the locality.

Shortly after this Mr. Van Orman and I were talking about the use of oxygen by the balloonists and stratosphere fliers. It occurred to us that it might be possible to force the hemoglobin to carry more oxygen by placing the patient in a positive pressure oxygen chamber. A suitable chamber was secured and treatment begun in a few selected cases.

There has been little in the form of precedent upon which to act. After we had begun the treatments we found reference to an article by End and Long of Marquette University, who, in 1942, experimented with laboratory animals—subjecting them to near lethal doses of carbon monoxide, then using oxygen

under pressure as a means of restoring them. The report would indicate very good results. They propose this method for use in the human for treating carbon monoxide poisoning. We have had no opportunity to test such a case but feel that it would be of definite benefit.

The literature on oxygen is voluminous but we have not yet encountered mention of this method of treating the more chronic cases of poisoning by the various fumes which are present in industrial plants and which seem to be growing more numerous and more complex chemically.

The patients were selected on a purely clinical basis. The three cardinal points were: 1, history of exposure to the fumes; 2, the physical findings of cyanosis and some pallor; 3, the mental symptoms as mentioned above.

The experimental nature of the method was explained to the patients and they, almost without exception, were happy to cooperate. There is a natural reluctance on the part of some people to get into a small closed space; in others a definite claustrophobia. We have not had any cases of panic or demands to be released.

Eleven patients have been treated by this method. Five of these were *bona fide* cases of toxicity from the inhalation of fumes and six properly belonged in other categories. I shall quote briefly the records.

Case I.—R.R.R. This patient first came for examination on October 24, 1943 with complaint of weakness, lack of ability to concentrate, and lack of interest in his work. In fact, he had been unable to do any useful work for about one and one-half years. His former occupation was that of rubber worker and he was in the departments in which he was exposed to the various fumes. Several things were tried, such as liver extract injections, tonics of various sorts, long walks in the fresh air, etc. On examination, he was pale, almost pasty in color, with poor muscle tone; there was a certain degree of cyanosis of lips, nails and skin. A general physical examination failed to reveal any outstanding lesion.

On December 16, 1943, he was placed in the oxygen cylinder for forty minutes at two pounds pressure. It could be easily observed through the windows of the cylinder that the cyanosis began to clear almost at once. Upon removal the evidences of cyanosis had all disappeared. The skin and mucous membranes were perfectly normal in appearance. There was much more pep and vigor than formerly. By January 20, 1944, he had had four treatments and there was a great deal of improvement in energy, appearance, and mental reactions. He was eating and sleeping much better and there had been a weight gain of fifteen pounds. On February 1, 1944, he was doing some work fixing his home, doing odd jobs, and was able to walk several miles each day. There was quite a bit of weakness, however, in his arms.

Case II.—Mrs. A.H., aged thirty-seven, a housewife and rubber worker, had worked on self-sealing gas tanks, and in the course of her work she inhaled various vapors and fumes. She was first seen on November 18, 1943. She came upon the insistence of her husband because she was depressed, irritable and nagging. She also had definite suicidal ideas. She felt herself a burden to her husband and wanted to go away. General physical examination was negative except for cyanosis.

In the beginning she was treated by a high vitamin regime and estrogenic hormone, with no apparent results. On December 4, 1943, she was placed in the oxygen cylinder for forty minutes at two pounds pressure. While in the apparatus the cyanosis could be observed to clear up in skin, lips and mucous membranes. Upon removal, she complained of a sense of dizziness lasting about one minute, then stated that she felt much better both physically and mentally. In all, she received four treatments from December 4 until December 21, 1943. Improvement was not noticeable in the mental reactions although there was also general physical gain. This continued and on January 4, 1944, she was given permission to return to work. She was seen twice since that time—on January 8 and January 13, 1944. She seemed able to handle her work and, while not entirely emotionally balanced, was adjusting much better to an unfortunate home situation.

Case III.—P.W., male, aged thirty, an electrician in a factory, had been working twelve hours, from 6:00 p.m. until 6:00 a.m. His work required him to be around vats from which escaped various fumes, and for probably four hours out of the twelve he inhaled these vapors. Frequently he became nauseated and dizzy. Recently his wife had noticed a definite change in his behavior. He stated that he had become dull, listless, and inefficient at his work. He was nauseated and dizzy. Ideas of reference and persecutory ideas had developed. He was sure that he had not done his work right and that the F.B.I. were after him. Physical and neurological examinations were negative except for the cyanosis and grayish appearance of mucous membranes and skin.

On December 7, 1943, he was placed in the cylinder for forty minutes at two pounds pressure. On being removed he looked at his wife and asked, "Where the heck did I get all those crazy ideas". This, however, was not the end of his troubles. According to the brother the ideas seemed to recur after about four days. On December 14th the treatment was repeated. On January 11, 1944, he again came for treatment. There was considerable clinical improvement both mentally and physically. On January 17 and January 21, 1944, he again came for treatment. At the last visit his wife reported that there had been a marked improvement for the better. He is attempting to find work at his former occupation and his reactions and behavior are approaching his normal self. He has not been seen since.

Case IV.—H.B., male, aged fifty, a supervisor in aircraft sub-assembly, worked with paints and paint thinner. About August 25, 1943, he became weak, nervous, irritable, unable to concentrate on his work, and developed the idea that certain persons in his department had it in for him. There were vague and ill defined fears. He came to my office October 26, 1943 with the above mentioned complaints. At that time he was unable to sleep and there was practically no appetite. Examination revealed a well developed adult male with no positive physical findings other than some cyanosis and some muscular weakness. He was advised to rest for a period and to secure as much fresh air as possible. He was also advised to take a high vitamin

diet and was given capsules containing large doses of the vitamin B complex. He continued to show a little improvement. On December 21, 1943 he was given treatment in the oxygen cylinder for the usual time, and on December 30, 1943, he was treated again. After each treatment he mentioned that he felt exhilarated, much as if he had taken a drink of whiskey, and that at about bedtime he became so sleepy it would have been an impossibility to stay awake. Little was seen of him until January 11, 1944, when he appeared at the office and stated that he would like to return to work. At that time he seemed much more alert and his appearance was that of health. He was given permission to return to work.

CASE V.—Mrs. Mary C., aged twenty-eight, married, a housewife, had worked for the past two years in bullet proof tanks. At this work she said she had inhaled many fumes which she could not identify. She did recognize carbon tetrachloride, however. For about the same length of time she had been dizzy, seemed all right as long as she kept moving at work, but became dizzy, weak and sleepy when she went out into the fresh air. There had been some confusion, with memory defects. She was emotionally unstable and had crying spells and had been so cranky that her boss had advised her to see a physician. Physical and neurological examinations were negative. Her blood pressure was 130/90. She was given treatment by the oxygen cylinder for thirty minutes at two pounds pressure. The reaction was as usual. She experienced quite a feeling of relief. The cyanosis disappeared and she remarked that almost immediately her head felt less confused than it had for a long time. She returned to work and has continued at work ever since.

The following cases are not in the category of toxic conditions, per se.

CASE VI.—J.B., aged fifty-eight, chemist in soap factory, was referred by Dr. Taylor because of mental and emotional depression and some difficulty in thinking. The history of this case was to the effect that in September, 1943, the patient had suffered a rather severe hemorrhage from the bowels, following which his blood count dropped to one million or thereabouts (this is the patient's statement). He said that all symptoms dated from that time. Dr. Taylor reported that he had made rather thorough studies of this patient just recently and that he was unable to uncover any organic basis for his complaints. These were many and varied—chiefly of indigestion and vague aches and pains, as well as some mental confusion, inability to do his work properly and to plan work for members of his department. The blood pressure was 130/80, peripheral vessels were soft, eye grounds negative. Neurological examination was negative. The only outstanding physical sign was a rather marked degree of cyanosis of face and lips, and some blueness of nails. I was not sure that he had been exposed to any volatile toxic substances but felt that his general reactions and the rather marked cyanosis warranted the use of oxygen.

Accordingly, the patient was treated as mentioned above on January 24 and 29 and February 1, 1944, at two pounds pressure for forty minutes. (Blood count on February 1, 1944 showed an entirely normal count.) After each exposure he felt a great deal relieved of the symptoms. He continued at work all the time. No report has been had since February 7, 1944, at which time his wife reported that he was feeling fine.

CASE VII.—A.M., aged forty-eight, married, a mechanical engineer balloonist and inventor. He was first seen in 1940 at which time he was suffering from a rather severe emotional depression from which he recovered after several weeks without hospitalization. At that time physical findings were negative except for an old injury to the right foot. He came in again on January 27, 1944, because he feared a return of his former illness. There was a sense of mental fatigue and weariness and an inability to organize his work as well as previously. An outstanding feature of the first illness was an insomnia which resulted in the patient practically existing without sleep. On the above mentioned date he was placed in the cylinder for forty minutes at two pounds pressure. He experienced some relief from the seeming lethargy but the striking feature was that he became naturally sleepy soon after the treatment and for the first time in months had a full night's rest. Reports since indicate that he had continued to sleep much better than before. He returned recently for another treatment, but this was not given because of an acute rhinitis.

CASE VIII.—L. H., a young woman, aged 17, was first seen on February 25, 1942. At intervals since that time I have seen her at the request of the mother and the maternal grandmother. It was my opinion that she was suffering from major hysteria and was possibly a potential case of dementia præcox. On November 29, 1943, she was brought to the office by the grandmother who was accompanied by a young man who said he knew Louise and had found her in the street in a confused state. She professed not to know her name or home address, nor to remember any of the happenings of the past twenty-four hours. She was placed in the cylinder for forty minutes at two pounds pressure. There were no immediate results, although she stated she felt better generally. Several days later she was seen. At that time she reported that she had slept well the night of the 29th, and that the following day she felt perfectly normal and that mental functions apparently were normal. She has been working ever since.

CASE IX.—L.T., a woman, aged thirty-five, was first seen October 5, 1943, at which time she was extremely nervous, sleepless, and unable to work on account of the extreme degree of weakness and tremors. Basal metabolism rate, urinalysis, blood sugar and nonprotein nitrogen were within normal limits. Serology was negative. The most troublesome symptom was insomnia. On February 1, 1944, she was placed in the cylinder for the express purpose of determining, if possible, the effect. She was placed in the cylinder for forty minutes at two pounds pressure. She retired at 10:00 p.m. that evening, slept until 9:00 a.m. the following day, awoke, ate breakfast and slept until 2:00 p.m. that day. This was without sedation or medication of any sort other than the oxygen.

CASE X.—T.L.E., a registered nurse, with no particular complaints, was placed in the cylinder for twenty-two minutes at two pounds pressure. There was quite a change in the appearance of the mucous membranes during and after the treatment. She experienced no dizziness upon removal from the cylinder and there was no difference in sleep. This was explainable perhaps, as she had never had any trouble sleeping.

Case XI.—B.D., a medical secretary, with no complaints, was placed in the cylinder for twenty-two minutes at two pounds pressure. There were no complaints upon removal from the cylinder. A later check showed that sleep was unusually good the following night. This was quite a change, since sleep ordinarily was none too sound.

Both the nurse and secretary remarked about the ease with which they breathed while in the cylinder.

Summary

In presenting these clinical findings to the Cleveland Clinic group, I believe I speak for both of us when I say that we are not so bold as to believe that we have perfected a form of treatment. Much work needs to be done to determine the limitations, the spheres of usefulness, in short, the true value, if any, of this method.

We do claim for ourselves originality in devising the method, as at the time we were not aware of the work of End and Long, and of Barach, Martin and Eckman.

The problem which prompted the first work was that of the industrial worker, sick from the inhalation of various vapors and fumes which are rapidly becoming more common in industry.

We have noticed certain things which are almost entirely clinical and have endeavored to set them forth.

1. The method as used is apparently free from danger.

2. Clinically at least, cyanosis and the external evidence of anoxia can be made to disappear.

3. It is a more easily controlled method of giving oxygen than either tent, face mask or nasal catheter.

4. Since the oxygen in the blood is in direct proportion to the alveolar pressure it becomes apparent that it is possible by this method to force more oxygen into the circulation than would be the case by other methods.

5. While this was begun as a treatment for toxic conditions, we feel that it may be found of value in a wide variety of conditions.

6. Last but not least, in insomnia it apparently works unusually well.

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RADON AND PHYSICAL THERAPY

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Introduction

Radon is the first product of the disintegration of radium. It is a gaseous substance, emitting chiefly the alpha rays. By a later disintegration process, beta and gamma rays are also emitted. The amount of these beta and gamma rays in alpha ray therapy is so infinitesimal that their significance for clinical purpose may be ignored.

The alpha rays are corpuscular, positively charged heliumatom nuclei. They are relatively large and penetrate the surrounding medium over a very short distance, the air, for instance, about three inches, human body tissue 0.1 mm. Even a thin sheet of tissue paper will completely absorb the rays. Therefore, we may consider the alpha rays as harmless, but due to their immense energy, equal to about eight million electronvolts[1], they are a very powerful therapeutic agent.

The radon does not enter any chemical reaction, but is soluble in different media, best in fats and olive oil. We used radon in ointment in our experiments.

Alpha ray treatment is one of the oldest forms of physicomedical treatments known, administered for centuries. We are referring to the spas which contain radon in their water. The quantities in the water are small, but the whole atmosphere is permanently charged with emanation and minimal quantities of radon are inhaled continuously. In the United States, the most famous emanating baths are Hot Springs in Virginia and Hot Springs in Arkansas. Their radon content is almost as much as that of the world-famous Spa Gastein in Austria, but much less than the radon content of Oberschlema in Germany and Joachimsthal in Czechoslovakia.

Radon activity decreases 0.75 percent every hour, i.e., it loses one-half of its activity in less than four days. The radon is completely eliminated from the body in a short time, usually two to three hours[2]. The accepted measurement in alpha ray therapy is the electrostatic unit (ESU), equaling 364 millimicrocuries. The measurement is important, the effect depending a great deal on the exact dosage. Small doses stimulate biological processes, while strong doses destroy human tissues. We also have to consider the fact that the radiosensitivity of different tissues varies. The most sensitive tissues to radon are the glands, especially ovaries and testes.

In alpha ray therapy, small doses are administered, and, therefore, the effect is a stimulating one. Experiments with different plants proved that emanation increases oxidation within the tissues. The alpha rays expelled from the radon in ointment have a great local and a certain general effect. The penetrating power of alpha rays being very weak, the radon has to be brought in direct contact with the skin or mucous membrane. (It should be mentioned that radon can be taken internally, since it does not enter any chemical reaction and is soluble in almost any human tissue, and is totally eliminated after a few hours[3]). The ointment penetrating the superficial layer of the skin, carried by the pores into the deeper tissues through a mechanism of micro capillarization, produces also there the alpha radiation and a little part of the radon gas enters by means of the capillaries the circulatory system of the whole body. The presence of alpha rays can be detected in the exhalation a few minutes after the external application. An erythema will appear locally after several applications or using one strong dose, which simulates the erythema caused by ultraviolet treatments. There is no danger of damage to the skin, even if, surpassing the limit, small blisters are visible, and interrupting the treatments clear the skin without any post damage.

[1]Proceedings of the Staff Meeting of the Mayo Clinic, May 31, 1944.

[2]Meyer, Stefan: *Strahlentherapie* Bd. 58. 1937.

[3]Klinghoffer, Stefan: *Amer. Jour. Roentgenol*, February 1943.

Generally speaking, radon causes a hyperemia and has an analgesic, antiphlogistic and epithelizing effect. The indications are practically the same as those of the roentgen surface therapy. The best known conditions in which radon in ointment is indicated, are indolent

Fig. 1.—Case III. Lateral and anteroposterior view of left wrist joint.

ulcers of unknown etiology, x ray damages, burns and keloids, which Uhlmann describes in many reports and considers radon ointment as almost specific in the treatment of skin injuries caused by roentgen rays, beta and gamma rays. He goes so far as to conclude that all such cases in which properly exerted alpha ray therapy does not lead to complete healing, carcinomatous change must be suspected, even if the lesion does not appear so clinically. After a study at the Skin and Cancer Unit of the New York Postgraduate Hospital, extending over a period of more than two years, Isaak came to the conclusion that results are excellent in treating chronic eczemas, lichen, neurodermatitis and other chronic skin conditions. It is especially interesting to learn of one patient whose condition healed under radon ointment, while other treatments, including x rays, were unsuccessful. The Mayo Clinic reported the outstanding effect of the alpha ray therapy. Dr. Henry H. Jordan also reported good results in the treatment of joint diseases.

Besides the broad field in dermatology, radon is successfully employed in many other fields, especially in neurology, gynecology, internal medicine and in combination with surgery.

We were interested in treating patients suffering from orthopedic conditions, not, or very slowly, responding to conservative and physical therapy. These included bursitis, tenosynovitis, osteoarthritis, epicondylitis, periarthritis and synovitis, myositis, neuritis, rheumatoid arthritis and other localized painful conditions.

Our experiments were made under the following conditions: 1. The majority of cases underwent physical therapy. Radon ointment applications were administered only in case of unsatisfactory results. 2. No other therapy was employed while radon ointment was administered. (These conditions do not apply to our private practice.)

The following case histories are typical in a series of thirty-five patients treated with radon in ointment in the physical therapy department of the Hospital for Joint Diseases over a period of about one year:

CASE I.—L. K., male, aged fifty-five years. The patient complained of pain in both knee joints, especially the left one. A cataract operation had to be postponed, because the patient could not lie in bed for more than two hours without suffering from severe pains. Diathermy, baking and massage were unsuccessful. The patient walked with a limp. There was no swelling of the joints, but there was extreme tenderness on pressure over the medial aspect of the left patella. Motion was restricted.

X ray showed spurring of the upper aspect of the left patella, and soft tissue swelling anterior to the lower end of patella. Laboratory findings were negative; sedimentation rate, 1 mm. Diagnosis, osteoarthritis, periarthritis.

There was complete restoration of function of the left knee joint after eighteen radon applications. There was no pain. The patient's cataract was operated on, and he went back to work. Thereafter, twelve more applications were administered to his right knee joint, with the same excellent result.

CASE II.—A. P., female, aged forty-seven years. The patient had complained of pain in the left knee joint for more than six months. Examination showed periarticular swelling of the left knee, and the patient walked with a left-sided limp. Motion of the knee showed some grating, and there was tenderness over the anterior aspect of the knee. X ray photographs showed the presence of moderately advanced hypertrophic arthritis and synovitis.

Treatment: Eighteen diathermy and massage treatments were given without relief. Thereafter, seven radon applications greatly improved the condition of the patient.

CASE III.—E. O., female, aged forty-one years. The patient complained of pain in the left wrist, with swelling. Examination disclosed a large ovoid area of soft

Fig. 2.—Case III. Left wrist joint after radon treatment.

tissue calcification anterior to the medial aspect of the distal end of the radius. All the osseous structures showed moderate decalcification. This shadow was clearly seen in the lateral view and also in the anteroposterior view (Fig. 1). The shadow was about the size of a bean and of equal density. At the Orthopedic Department, excision of the calcified mass was advised, but the patient did not want it at that time. She was referred, therefore, to the physical therapy department

for treatment. Laboratory findings were negative; uric acid was normal.

Treatment: After ten radon ointment applications pain and swelling entirely disappeared. A control x ray was negative (Fig. 2).

Fig. 3.—Case V. Calcification of left subacromial bursa.

Case IV.—W. T., male, aged forty-six years. The patient complained of severe pain in his left knee joint. He had been disabled for four years, and had not been relieved by several series of diathermy treatments. Examination disclosed that the patient walked with a limp; great tenderness on pressure existed on both sides of the patella. X ray findings were negative. Diagnosis, chronic synovitis left knee.

Treatment: The patient received nineteen applications of radon ointment. His condition improved after six treatments, considerably after twelve treatments, and he went back to work completely relieved after nineteen treatments.

Case V.—A. A., male, aged fifty-six years. The patient complained of pain in the left upper extremity, which had existed for many years. He had not obtained relief from previous physical therapy treatments and numerous Kirkavin injections. Examination showed markedly restricted motion, and extremely painful. X ray showed calcification of left subacromial bursa (Fig. 3). Laboratory findings were negative; sedimentation rate, 20 mm.

Treatment: After nine radon ointment applications the patient was completely relieved and was discharged. A control x ray was negative (Fig. 4).

Case VI.—B. P., female, aged thirty-eight years. She had complained of severe pain on the inner side of the right elbow for over one year, and had received no benefit from physical therapy. Examination disclosed swelling of the joint, but no limitation of motion. There was marked sensitivity of the internal epicondyle of the right humerus. X ray and laboratory findings were negative.

Treatment: Two novocaine injections gave temporary relief. In starting treatments the patient suffered severe pain. After four radon ointment applications she was completely relieved.

Summary of Hospital Cases

DIAGNOSIS	NUMBER OF TREATMENTS	TOTAL DOSAGE[1]	RESULTS
Bursitis subacromial	6	12,000 ESU	excellent
Bursitis subacromial	12	24,000 ESU	moderate
Bursitis subacromial	9	20,000 ESU	excellent
Bursitis pretrochanteric	12	24,000 ESU	greatly improved
Bursitis pretrochanteric	12	24,000 ESU	improved
Tenosynovitis	4	6,000 ESU	greatly improved
Tenosynovitis	7	14,000 ESU	improved
Tenosynovitis	3	6,000 ESU	moderate
Tenosynovitis	12	24,000 ESU	moderate
Neuritis	4	8,000 ESU	greatly improved
Osteoarthritis	10	28,000 ESU	excellent
Osteoarthritis	4	10,000 ESU	greatly improved
Osteoarthritis	18	40,000 ESU	excellent
Osteoarthritis	18	36,000 ESU	improved
Osteoarthritis	7	14,000 ESU	improved
Osteoarthritis	12	24,000 ESU	moderate
Epicondylitis	4	8,000 ESU	excellent
Epicondylitis	2	4,000 ESU	excellent
Epicondylitis	3	6,000 ESU	improved
Epicondylitis	4	8,000 ESU	excellent
Epicondylitis	10	20,000 ESU	improved
Epicondylitis	12	24,000 ESU	moderate
Epicondylitis	12	24,000 ESU	negative
Epicondylitis	4	8,000 ESU	excellent
Periarthritis	19	40,000 ESN	excellent
Periarthritis	18	40,000 ESN	excellent
Periarthritis	12	26,000 ESU	excellent
Periarthritis	7	14,000 ESU	improved
Peritarthritis	12	26,000 ESU	moderate
Rheumatoid arthritis	12	24,000 ESU	negative
Myositis	12	26,000 ESU	moderate
Dupuytren's contracture	4	8,000 ESU	negative
Tissue calcification	10	20,000 ESU	excellent
Osteoporosis	10	20,000 ESU	excellent

Fig 4.—Case V. Left shoulder joint after radon treatment.

[1]Radon ointment with a strength of two hundred electrostatic units per cc. was applied in each case; e.g., six treatments, each ten cc. x two hundred electrostatic units per cc. gives a total dosage of twelve thousand electrostatic units.

In addition, forty-two private patients were treated in the office. The radon ointment treatments were combined with physical therapy, massage, novocaine infiltrations and proteolac injections. Radon was applied twice, later once weekly.

DIAGNOSIS	NUMBER OF CASES	RESULTS
Neuritis	5	3 completely relieved 1 improved 1 negative
Epicondylitis	8	all completely relieved
Osteoarthritis	9	pain relieved almost completely in 6 cases, 1 improved, 2 did not respond
Periarthritis	4	3 completely relieved 1 improved
Bursitis	7	5 completely restored 2 remained limited in motion, but without pain
Tenosynovitis	4	3 completely relieved 1 improved
Meniscus lesion	2	1 completely relieved 1 negative
Rheumatoid arthritis	3	3 greatly improved

We have had no experience in treating the socalled "painful heel", described under different names as tarsalgia, plantalgia, calcaneodynia, and by Bettmann, as calcaneitis. This condition was also studied by Kolbe who arrived at the following conclusion: Calcaneus spur is without significance regarding the pain, as long as the exostosis is anatomically composed of healthy, bony tissue. Syphilis, gonorrhea and arthritis are also negligible. The painful heel is usually associated with a phlebitis of the saphenous veins and to a lesser degree caused by a chronic periostitis of the os calcis. This condition is stubborn, results obtained with radon ointment seem to be superior to other treatments, but failures are not infrequent.

Conclusion

Radon ointment applications are effective in the majority of chronic inflammations of joints, including bones, capsule, tendons and bursæ. The administered doses were relatively small. A standard preparation of radon in ointment was exclusively used, containing two hundred electrostatic units per cc., of ointment, applied twice weekly in amounts of ten to twenty cc. According to the number of applications, the total dosage used ranged between four thousand and forty thousand units. The technique applied was described by Jordan (5), who also reported excellent results. However, we never went as far as Jordan, who sometimes used fifty cc., of radon in ointment for one application, leaving it for thirty-six to forty-eight hours. Strong skin reactions were observed even in the relatively small doses used. It is unpredictable when an erythema will appear and how intensive it will be. The pigmentation of the skin does not serve as a guide. As a matter of fact, strongest reactions were observed in colored people.

As mentioned above, the erythema is the criterion of effectiveness, i.e., if the patient has no or unsatisfactory relief, in spite of the appearance of a strong erythema, further applications have no effect. We found it advisable to apply radon again in these cases after a rest period of at least three weeks and to combine it with physical therapy. The results were often surprisingly good.

In forming an opinion, we have to consider one outstanding fact: Radon ointment applications are unimpressive. The administration of an ointment, absolutely neutral in color and odor and not causing immediate skin irritation, seems to be unsatisfactory to the patient. The attitude of the patient is rather negativistic, and there is hardly one who does not suggest another therapy if he has no relief after the first application. Therefore, we always inform the patient before the first application of radon of the character of the treatments and when an improvement may be expected.

The question is still open whether radon ointment therapy has a place on the side of superficial x ray and Grenz ray therapy. The fact remains that radon may be administered at any office, at the bedside of the patient, and without any machinery. Furthermore, the results compare favorably with x ray treatments, and the radon ointment therapy can be used when x ray treatment is not desirable or contraindicated; e.g., near the ovaries and testes. It must be emphasized that no damage to the exposed tissues was observed.

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5 WEST EIGHTY-SIXTH STREET

LOWER BACK PAIN

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There comes a time when every branch of specialized medicine or surgery has to take stock in studying carefully the labeled diagnosis put away on its shelf as taken for granted without question. However, it does often happen that certain bundles of knowledge, tucked away after keen scrutiny and examination, somehow bear the wrong label or diagnosis.

In order to come to the truth which is synonymous with scientific medicine, specialists in different branches of medicine should confer constantly. If this is not encouraged, each specialty of medicine tends to become limited to a narrow sphere and thus loses even its own standing in the medical world. The field of medicine and surgery has many component parts, interwoven and held together by chains and links on which the entire structure depends for its strength. If the smallest

link loses its connection with another, then the weakness is felt throughout. For this reason, the aim of every modern internist or surgeon, whatever his specialty may be, should be, above all, a proper diagnosis.

One sometimes wonders why in this day and age of civilization and science so many people flock to the unscientific practitioner or the socalled cults of medicine. In this stage of knowledge and enlightenment, why does scientific medicine fail to meet the needs of such a common ailment as lower back pain? Why do these patients, thousands of them, pass the door of the orthopedic surgeon, who is a scientific medical man, and search for a medical cultist to obtain a massage or an adjustment for relief? The answer is simple and pathetic; scientific medicine has failed to bring about a permanent cure, so palliative relief is being sought from whatever source it may be obtained. While scientific medicine fails to cure permanently, the cultist reaps his reward in giving to those sufferers some relief by means of palliative treatment, such as massage and baking, which increases the circulation of the parts involved.

One of the most common of human ailments, lower back pain, usually diagnosed as sacroiliac or lumbosacral, has given more spoils to the irregular practitioners, who treat by the use of massage and adjustment of the vertebra, than any other known ailment.

Reviewing the modern works (papers or text books) on lower back pain, one notes the many causes given, such as tumors, inflammation, specific disease, mechanical derangement due to trauma or congenital malformation; misplaced pelvic organs (such as retroverted uterus), and, noted recently, ruptured or misplaced intervertebral disks. All the above enumerated conditions are true scientific causes of lower back pain. However, the most common cause of lower back pain is almost always ignored or omitted.

The orthopedic surgeon may be excused for this omission for he says that he is considering the etiology only from an orthopedic point of view. The gynecologist may have the same excuse. However, this seems to be no excuse for the patient suffering from lower back pain who wants a cure. And what is the excuse of the general surgeon or the internist who looks at scientific medicine from a broader point of view? The only excuse for all of them apparently is that our proctologists have so far failed to realize the importance of high seated internal hemorrhoids in relation to lower back pain, and, if you please, also to socalled sciatica pain. Therefore, it would really be too much to expect from the other practitioners when the proctologist unconsciously leaves out this symptom of lower back pain as one of the cardinal symptoms of hemorrhoids.

He, too, may be excused for he is basing his assertion on the results he has obtained from the average hemorrhoidectomy. Since the patient is suffering from lower back pain after the operation or even the antiquated method of injection, the foregoing statements must be unscientific. However, the truth is that the average hemorrhoidectomy in about thirty to forty percent of the cases does not remove high seated hemorrhoids. The same applies to the injection method, because the hemorrhoids are not sclerosed properly.

Blond's therapy and basic principle have been reported recently in the Medical Record and also in the *Journal of the National Proctologic Association!*

Therefore, since backache, the common human ailment, which is commonly diagnosed as of lumbosacral or sacroiliac origin, after all other findings have been found negative, is being referred to the orthopedic surgeon for treatment, this paper should serve as a reminder. If a patient does not respond to his general treatment, it is not the fault of his specialty of orthopedic surgery, for this branch of medicine, as any other branch of medicine, has its limitations.

Not every case of lower back pain can be considered as being caused by internal hemorrhoids. It goes without saying, however, that in all these cases the patients must have a complete physical examination, and all the cases mentioned above should be ruled out by physical and x ray studies. However, a rectal examination with the proper proctoscope (Blond) is more than essential in these cases.

It often happens that the x ray may show some pathological condition at the iliosacral or lumbosacral points. Even in these cases or, I should say, especially in these cases where and when these parts of the human anatomy, already scarred by disease, are more sensitive to outside pressure from hemorrhoids, hence resulting in lower back pain or socalled sciatica pain. This can be illustrated as follows:

A patient complains of pain in the abdomen after a cholecystectomy, and the case has been diagnosed as postoperative adhesions. This diagnosis may be correct, but the pain is not caused by the adhesions *per se* unless there is a pulling on the adhesions. This pulling is caused by gas (generally found in the cases due to hemorrhoids). The same is explained in these socalled lumbosacral or sacroiliac pains, especially with an x ray showing some hypertrophy. Pain is due in these cases to pressure on some of the nervous network supplying the neighboring areas.

This explanation may sound foreign to some, therefore, I have taken seven cases at random—patients who came to the clinic or office complaining of lower back pain with or without slight symptoms which would make one suspect rectal varicosities. However, on physical examination, hemorrhoids were demonstrated by Blond's proctoscope.

These hemorrhoids were treated by the injection method of Blond or sclerosing them. It is remarkable how these symptoms of lower back pain and socalled sciatica pain generally start to fade away gradually from the first treatment. Cure is generally established after the full sclerosis of these varicosities.

Case Reports

Case I.—F. W., male, aged fifty-two, June 25, 1938. The patient's chief complaint was sciatic pain on the right side and fistula in ano, for which an operation had been performed five years before and was apparently healed. Examination revealed internal hemorrhoids. The patient received thirteen treatments.

This case illustrates the relation existing between anal fistulæ and hemorrhoids which is generally overlooked, and also the referred symptoms of sciatic nerve involvements which are often treated as sciatica proper without results.

Case II.—S. E., female, aged fifty-four, March 17, 1939. The patient's chief complaint was pain in the lower part of the back and belching of gas; constipation was marked. The results of a physical examina-

tion, including urine and Wassermann tests, were negative. A rectal examination showed internal hemorrhoids. This patient received eleven treatments from March 17th to August 14th with good results. On October 1, 1941, the patient complained of lower back pain, with the other symptoms, and she was given nine more treatments, at intervals, up to December 15, 1942. She is now symptom free. She required more treatments than the average case because the intervals between treatments were much longer than a week, which is the time allowed in the average case.

CASE III.—L. V., female, aged twenty-nine, June 22, 1942. The patient's chief complaint was pain in the lower part of the back. She said she had had a perirectal abscess some time ago. Physical examination, including a vaginal examination and a urine test, was negative. This patient, a waitress by occupation, said that before she was a waitress she had had the same pain, therefore the condition was not due to her work. It is remarkable that this patient improved after the first treatment, and after the second treatment, her record read "backache absent or very slight". After receiving the third treatment the patient stopped the treatment. Apparently she discharged herself because she was free of the chief symptom that brought her into the office.

CASE IV.—B. S., male, aged thirty-three, January 2, 1942. The patient's chief complaint was pain in the lower part of the back. Physical examination, including a urine test, was negative. Because of gas and dull pain in the epigastric region, a gastrointestinal series was taken which proved to be negative. A rectal examination showed the presence of hemorrhoids. This patient stated that he had less pain in the back after the first treatment of the hemorrhoids. This symptom, as well as the other symptoms, subsided after five treatments.

CASE V.—M. P., male, aged forty-one, April 20, 1943. This patient's chief complaint was acute pain in the lower part of the back. He was seen for the first time at home on account of the back pain which forced him to go to bed. At the first visit, local applications were prescribed and rest in bed. On April 23, 1942, physical examination at the office, including a urine test, was negative. The patient was strapped. A rectal examination showed internal hemorrhoids, and the first treatment given for them. An x ray of the spine showed hypertrophic change in both sacroiliac joints. On the second visit, one week after the first treatment, the pain in the back had subsided. This patient received six treatments up to June 1943. The pain in the lower part of the back subsided and improved gradually, as well as the other symptoms, such as pruritus ani, but the back pain was the chief symptom which forced him to go to bed and he had then come to the office for treatment.

CASE VI.—L. C., male, aged twenty-five, March 10, 1943. The patient's chief complaint was a sore back, which had lasted about one year. He was always tired, especially on getting up in the morning, which is typical of rectal varicosities. Physical examination was negative, including the urine. Rectal examination revealed internal high seated hemorrhoids.

I report this case, although the patient did not return for treatment. However, because he had no other symptoms which would make one suspect or look for rectal varicosities, there is no doubt that he would have received excellent results for the lower back pain had he been treated.

CASE VII.—F. D., female, aged fifty-eight, June 15, 1943. Her chief complaint was pain in the left upper hip, described by the patient as a troubling pain, and pain in the epigastric region. Physical examination, including urine and Wassermann tests, was negative. This patient reported one week after the first treatment that the pain (in the left hip joint) had almost gone. Because she received marked improvement this patient followed up the treatment until she received the sixth treatment on July 21, 1943. Treatments were given at weekly intervals.

Some explanation must be made as to the fact that in some cases, as in Case II, the patients required about twenty-one treatments, while in Cases III and VII, there were remarkable results after the first or second treatment. The answer is, that since the pain is caused by pressure of some particular dilated vein, the pain lasts as long as this particular hemorrhoid has not been sclerosed. On the other hand, there may be hemorrhoids and without lower back pain or sciatica, just as there may not be constipation or any of the other common symptoms. However, if there is lower back pain and sciatica, generally if the patient suffers from rectal varicosities, these dilated veins must be sclerosed thoroughly to render permanent scientific treatment effective.

The patients are always instructed to come for a check-up after six weeks, six months, and at the end of the year. Therefore, if patients, after receiving marked improvement or cure after the average course of six to ten treatments, fail to follow instructions and do not report, it is concluded they feel well.

Summary

I do not wish to convey the idea that all back pains are due to internal hemorrhoids. However, it is true that in every case where faulty posture, pes planus, and focal infection have been ruled out and no permanent cure established, internal hemorrhoids should always be thought of. Before these patients fall into unscientific hands, one should make certain that they do not suffer from rectal varicosities.

If this paper, with its seven reported cases, will help to bring scientific treatment to some case of lower back pain, I shall have good reason to be satisfied.

736 HANCOCK STREET

Red Cross Expands Whole Blood Program

In response to urgent requests from the Pacific battle area for more whole blood, the American Red Cross is extending the West Coast whole blood project to include San Diego, Calif., and Portland, Ore., and at the same time, the procurement of whole blood in San Francisco, Oakland, and Los Angeles is being stepped up. With this addition, all West Coast centers will be procuring whole blood as well as plasma. Definite whole blood quotas have not been set, because the amounts required vary according to military needs. Each Center will regulate whole blood procurement according to the need at the time, and the rest of the blood will be processed into plasma, which is also urgently needed. Whole blood is used primarily in hospitals and aboard hospital ships to supplement the use of plasma in the front lines.

Editorials

Penicillin

One of the most constructive measures taken by our government has been the backing, financial and otherwise, given to the producers of penicillin. The amount of money invested in the marvelous drug in all of the penicillin plants in this country was less than the price of a small battleship.

The speed with which the producers of penicillin accomplished their goal is truly remarkable. Scarcely a month went by when improvements were not made and no one dared hope, when the projects were started somewhat over a year ago, that such large scale production would be made possible. The government not only helped furnish capital for many penicillin plants but cooperated all along the way in facilitating the acquisition of needed supplies and equipment and aided in many ways in improving the methods of production. We also must not neglect to mention the splendid work done at Stanford University, the University of Wisconsin, and the University of Pennsylvania where new strains of the organism producing penicillin were developed, new culture media were worked out, and improved methods in fermentation and recovery made available to the producers.

Penicillin is now being made available for civilian use which means that sufficient quantities have been made for military requirements and that the medical profession and the public will now get the benefit of the energy, cooperation and effort which has been manifested by the manufacturers, the government and the various scientific agencies who have been more than helpful. A long step forward has been accomplished in combatting many of the ills of mankind by capturing and utilizing penicillin, one of the simplest elements of nature.

Limitations of Penicillin

Recently the doctor's mail has been fairly flooded with offers of penicillin because of its "release" by the Government on March 15th. Some concerns have solicited advance orders with the promise of sending a bill for later payment.

There is danger of a wild scramble to put penicillin in everything one eats, drinks or rubs into the skin, and we may anticipate lozenges, cough medicine, chewing gum, mouth washes, laxatives and skin cream "impregnated" with penicillin. Such efforts will vitiate the real value of penicillin which now bids fair to become one of the great discoveries of our time or of any other time as a life-saving agent. In fact, its amazing potency has been demonstrated by hundreds of clinicians when a patient was *in extremis* from commonly fatal diseases such as meningitis and cavernous sinus thrombosis. Fortunately the "reactions" from it are limited to skin rashes or mild toxic manifestations which may have been due to impurities rather than to the "drug" itself. The National Research Council has the power, and doubtless will exercise its good offices to set forth the facts concerning proper and improper usage. Governmental authority may also be exerted to control the future of penicillin as it has controlled its past.

It is well to keep in mind the contraindications as well as the indications for administration. Just now the indications seem to be to some minds anything and everything from falling hair to ingrowing nails. But so far, we know that it is valueless in virus infections (which is extremely regrettable), and in gram negative infections such as undulant fever, psittacosis, tularemia, tuberculosis, typhoid fever, malaria, leukemia, blastomycosis, ulcerative colitis, rheumatoid arthritis and certain other afflictions. The list is not yet complete. However, some progress has been made in treating with the sulfa group (sulfadiazine), usually by mouth, and injecting penicillin into the muscles synchronously. We then have a sort of two-way means of combatting some disorders, which do not yield to either agent when used alone.

One must remember too how germs have a way of self-defense against our best efforts to kill them or render them inert. There have been statements to the effect that organisms may become penicillin-fast, but under just what conditions is not quite clear. We know that prolonged use of a single agent or drug seems to meet with resistance so that the effect "wears out" and we have to "change to something else." The science of bacteriology is still relatively new, and the study of germ growth and life, while fascinating, is fraught with difficulties and misinterpretations. The biology of disease germs is a subject which, doubtless, will yet attract a group of young and enthusiastic investigators far beyond its present status.

At the present time we do know that penicillin is highly potent in local infections (cellulitis), and when systemic signs appear from transference to blood and lymph streams, bacteria are held in check until the natural defenses of the body can conquer the enemy. In sinus thrombosis, meningitis and brain abscess, timely surgery is made effective and ultimately completely successful where penicillin is used intravenously or intramuscularly, but it must be given frequently or in large doses or by continuous "drip" methods. In other words it is promptly eliminated through the emunctories, and efforts are now making to increase its length of stay in the body. It is especially useful in meningitis which long has been regarded as almost

uniformly fatal. Aural surgeons know this only too well, and they are loud in their praise of the new ally. However, penicillin seems not to enter the cerebrospinal system from the blood, or if it does, not in sufficient concentration to become bacteriostatic. Therefore, intrathecal administration becomes necessary in many instances.

In osteomyelitis, organisms which live and thrive in bone must be reached by surgery, local "soaking", and through the blood and lymph pathways. The time of sequestration is shortened, the end results are then highly pleasing.

By recognizing the essential limitations of our new "friend" we may proceed to great heights of therapeutic efficiency.

Hospitals' Liability to Visitors

The wife of a seriously ill hospital patient went to the hospital to visit her husband. The only access to the hospital from the street was by a driveway which the complaint in an action against the hospital described as being a glare of ice, from which the last sanding had been washed away by rain several hours earlier, as was well known by the hospital's superintendent. There was no separate footwalk.

The visitor entered in the evening from a street that was well sanded. Before entering, she observed the condition of the driveway as described in her complaint. She proceeded carefully, but fell and was injured when she attempted to step aside to avoid being hit by an outgoing automobile. On evidence of these facts, she obtained a directed verdict. The hospital excepted. The New Hampshire Supreme Court sustained the exceptions and rendered judgment for the defendant. (Sandwell vs. Elliott Hospital, 24 A. 2d 273).

The relationship of a patient's visitor to a hospital has usually been described as that of an "invitee" or a "business visitor", without reference to whether the entrant is a pure caller or comes to help the patient to enter or leave the hospital. This case was presented as if the plaintiff were a "business visitor". With this theory, however, the court did not agree, holding that the "business visitor" or "invitee" relationship depends upon the mutual benefit of the visit to the entrant and the possessor of the premises. "If", the court said, "there would have been any benefit or advantage to the defendant in the plaintiff's intended visit to her husband, if it would have had even the slightest tendency to forward the business or promote the interests of the defendant, the benefit or the tendency would have been purely accidental. Those who enter a hospital merely to make a call upon a patient, are, of course, suffered by the hospital to be there, but they come to see the patient not the hospital. The primary mutuality of interest is that of caller and patient."

The defendant's "business" was that of a public charity. As such it was entitled to some consideration concerning its duty of care even to its patients beyond what an ordinary business corporation can claim. Under the circumstances of this case, where mutuality of interest of the parties was faint, if it existed at all, the court concluded that the plaintiff was not to be treated as a "business visitor" of the charitable defendant.

The plaintiff was held to stand "no better than a 'gratuitous licensee,' to whom no duty is owed as to the condition of the premises, except to warn of dangers actually known by the defendant and not open to ordinary observation by the plaintiff. Since the icy condition and the attendant dangers were fully observable and fully appreciated by the plaintiff, no duty was imposed on the defendant."

Obituary

The Honourable William Renwick Riddell

One of the oldest contributors to the MEDICAL RECORD, Chief Justice William Renwick Riddell, LL.D., D.C.L., died at his home in Toronto, on February 18th. Riddell was one of the most learned men that we have ever met. His formal education included the Cobourg Collegiate Institute and Victoria University in Toronto, and he was a gold medalist at Osgoode Hall where he was graduated in 1883.

In spite of his education he was a learned and sensible man with a deep sense of responsibility to mankind and a profound appreciation of the incongruities of life which lent a keen edge to his sense of humor.

He held eleven honorary degrees from various universities in Canada, the United States and Britain, and was the senior honorary member of the American Bar Association, a Fellow of the Royal Historical Society and of the Botanical Society of Edinburgh. He was a great friend of Sir William Osler, who once offered him an honorary M.D. degree from the University of Oxford. His interests were extremely varied as can be seen from some of his published works, "La Rochefoucauld's Travels in Canada, 1795", "Old Province Tales", "Michigan Under British Rule", and many others.

When he first started to practice law, he became enmeshed in many murder cases, and he enjoyed talking about these and the many queer quirks which he encountered and their legal ramifications. He read with ease Hebrew, Latin, and Greek, and one of his chief enjoyments was to write on historical medical subjects, most of which were published in the MEDICAL RECORD.

We, unfortunately, were involved in what he considered his favorite story: a previous report, somewhat premature, of his death. In a rare good humor he took us to task for paying any attention to a news item which told that he had died. He was an unusually remarkable man, kind, just, unbiased. To the last he was alert and unchanged. We regret his passing but remember with deep gratitude and pleasure the rich, full and useful life this man lived.

News Items

Stuart McGuire Lectures.—Dr. R. H. Smithwick, of the Massachusetts General Hospital, Boston, delivered the annual Stuart McGuire lectures in the Simon Baruch Auditorium on April 5th and 6th.

New England Society of Physical Medicine.—At a regular meeting of the New England Society of Physical Medicine, held in Boston Wednesday evening, March 21, Kurt S. Lion, Eng. D., assistant professor of applied biophysics at the Massachusetts Institute of Technology, read a paper on the "Physics of Short Wave Therapy".

Club for Research on Aging.—The American Division of the Club for Research on Aging has elected the following officers to serve for the ensuing year: chairman, Dr. William deB. MacNider; secretary, Dr. Edward J. Stieglitz; executive committee, Dr. E. V. Cowdry, chairman, Dr. Joseph C. Aub and Dr. A. Baird Hastings.

Harvey Lecture.—The sixth Harvey lecture was delivered at the New York Academy of Medicine Thursday evening, March 15th, by Dr. Edwin B. Astwood, assistant professor of pharmacotherapy, Harvard Medical School. The topic of the lecture was "Chemotherapy of Hyperthyroidism".

Biggs Memorial Lecture.—The twentieth Hermann M. Biggs Memorial Lecture was delivered on Thursday evening, April 5th, by F. C. Bishopp, Ph.D., assistant chief in charge of research, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture. The topic of the lecture, which was given under the auspices of the Committee on Public Health Relations, was "The Medical and Public Health Importance of the Insecticide DDT".

Symposium on Reconstructive Surgery.—At a combined meeting of the Sections on Surgery and Orthopedic Surgery of the New York Academy of Medicine, held on Friday evening, March 16th, the scientific program consisted of a symposium on the problem of reconstructive surgery. Dr. Arthur G. Davis outlined the general problem of reconstructive surgery, and Major Karl F. Mech, M.C., A.U.S., discussed the patient's part in handling the problem. Lieut. Commander S. Baron Hardy, M.C., U.S.N.R., described the various plastic procedures used, and Dr. Philip D. Wilson discussed the bone procedures.

Dangers from Tropical Diseases.—At a meeting of the Society of Medical Jurisprudence, held at the New York Academy of Medicine, Monday evening, March 12th, Dr. Howard B. Shookhoff, epidemiologist in the tropical diseases diagnostic service bureau of preventable diseases, New York City Department of Health, read a paper entitled, "Dangers from Tropical and other Diseases which Threaten Us as a Result of Global Warfare". Dr. Shookhoff discussed malaria, dysentery, filariasis, yellow fever, typhus fever and various other diseases endemic in areas involved in our global warfare. Particular attention was directed to preventing the importation of insect borne diseases and the value of DDT as an insecticide was considered. As a preventive measure, the importance of adequate facilities for the diagnosis of tropical diseases was emphasized. An interesting discussion followed.

Penicillin for Civilian Use.—Formal control over penicillin was relinquished by the Government on March 15th and the drug is now being distributed for civilian use through normal trade channels. Dr. John N. McDonnell, director of the War Production Board's Office of Penicillin Distribution, said that 1,280,000 vials of the drug were made available through March 31st and 1,500,000 vials would be allocated through April and succeeding months.

Iowa State Medical Society Cancels Meeting.—The annual scientific program of the Iowa State Medical Society, which was scheduled to be held in Des Moines, April 19th and 20th, has been cancelled in compliance with the request of the Office of Defense Transportation to dispense with all meetings of over fifty persons in the furtherance of the country's war effort. A meeting of the House of Delegates will be held if certain legal technicalities can be met.

Army Medical Research Board.—A medical research board has been set up in the Office of the Surgeon General to coordinate all Medical Department research with other staff agencies and components of the Army as well as with agencies outside the Army. Major General George F. Lull, deputy surgeon general, is president of the board; Colonel Thomas B. Turner, M.C., is special assistant to the president, and Lieutenant Colonel Leon H. Warren, M.C., is recorder. The Executive Committee for the board includes Brigadier Generals James S. Simmons, Stanhope Bayne-Jones, James A. Kelser, and Rex McKinley McDowell; Colonel Howard F. Currie, M.C., and Lieutenant Colonels Roy H. Turner, John B. Klopp, M.C., and Michael E. DeBakey, M.C.

Symposium on Industrial Medicine.—A five-day course in industrial medicine was presented by the New York Post-Graduate Medical School, Columbia University, April 2d to 6th, under the direction of Dr. Harry J. Johnson and Dr. Frank R. Ferlaino. This course was planned for industrial and public health physicians. In addition to the teaching staff of the School, the following guest speakers took part in this symposium: Dr. Leverett D. Bristol, Dr. C. Charles Burlingame, Miss Patricia Edgerly, Dr. Frederick B. Flinn, Dr. Forest D. Gibson, Dr. Eugene J. Gillespie, Dr. Edward C. Greene, Dr. J. P. Hoguet, Dr. J. F. Johnson, Dr. A. J. Lanza, Dr. Raphael Lewy, Dr. Richard M. Mills, Dr. Dwight O'Hara, and Dr. Charles R. Williams.

American Psychiatric Association Cancels Annual Convention.—The American Psychiatric Association, the oldest medical society in America, has announced the cancellation of its one hundred and first annual meeting which was to have been held in Chicago, in May. It was the feeling of the Association that it would be the duty of the membership to fall in line with the request of the United States Government to cancel conventions in the spirit of the war cooperation. A meeting of the councillors of the Association was held on February 26th and 27th to devise means of taking care of urgent business of the Association arising out of the cancellation of the annual meeting. The Association has been extremely active in war psychiatry during the past two years and the councillors formulated plans for continuing the contribution made by members toward the advance of the war effort.

American Board of Obstetrics and Gynecology.—The general oral and pathology examinations (Part II) for all candidates will be conducted at Atlantic City, N.J., by the entire Board, June 14th to 19th. Formal notice of the exact time of each candidate's examination will be sent him in advance of the examination dates. The Office of the Surgeon-General (U.S. Army) has issued instructions that men in Service, eligible for Board examinations, be encouraged to apply and that they may request orders to Detached Duty for the purpose of taking these examinations whenever possible. For further information and application blanks, address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh 6, Pa.

Tropical Disease Control.—A tropical diseases control program is being developed in the States Relations Division to meet the serious clinical problem posed by an expected increase of cases of tropical diseases in the United States, as a result of the war and of increased air travel, according to the *Military Surgeon*. The program is concentrated on seven diseases—malaria, amebiasis, ankylostomiasis, filariasis, leishmaniasis, schistosomiasis, and echinococcosis. Medical Director L. L. Williams, Jr., is heading the program, assisted by Paul Weinstein, parasitologist. Dr. Williams plans to employ six additional parasitologists and fifty technicians. The program is necessary because the general practitioner has little knowledge of the diagnosis and treatment of tropical diseases and few laboratories are acquainted with the exotic parasites or the methods for their discovery and identification. The most urgent of these two needs is the education of laboratory personnel. Under the program, a team of itinerant full-time lecturers will be used to stimulate the practitioners' awareness of the problem of tropical diseases and to bring them information on diagnostic points and therapy. The lecturers will contact local physicians through State health departments and State and local medical societies.

Salmon Lectures for 1945.—Dr. C. Charles Burlingame, chairman of the Salmon Memorial Committee, has announced the selection of Dr. Roy Graham Hoskins as the Salmon Memorial Lecturer for 1945. Dr. Hoskins, research associate in physiology, Harvard Medical School and director of the Memorial Foundation for Neuro-Endocrine Research, Boston, Mass., and the Worcester, Mass., State Hospital, has, for some eighteen years, devoted much of his time to research concerning endocrine disturbances in mental disease. He is internationally known for his contributions to both the neuroendocrinological and physiological fields.

"The Biology of Schizophrenia" will be the title of the Salmon Lecture Series to be given at the New York Academy of Medicine on three successive Friday evenings—November 2d, 9th, and 16th. In his introductory lecture, Dr. Hoskins will cover the nature of schizophrenia; the second lecture will deal with manifestations of schizophrenia at six different levels of integration—cellular, reflex, autonomic-endocrine, behavorial, intellectual and personal-social, and the third and last lecture of this series will deal with the treatment of schizophrenia and needs for the future. The Salmon Committee on Psychiatry and Mental Hygiene, appointed by the Council of the New York Academy of Medicine, is sponsoring these lectures.

Personal.—Dr. Thomas J. Kirwin read, by invitation, a paper on urologic roentgenology at a meeting of the New York Roentgen Society, Monday evening, March 19th.

Dr. C.-E. A. Winslow, chairman of the department of public health at Yale University and for thirty years Anna M. R. Lauder professor of public health, will retire at the end of the current academic year. He will be succeeded by Colonel Irá V. Hiscock, professor of public health, now on leave of absence as chief of the public health section of the Civil Affairs Division of the War Department.

Dr. Francis Carter Wood, professor emeritus of pathology at Columbia University and director of pathological laboratories and of radiotherapy at St. Luke's Hospital, was the guest of honor at a tea given at the hospital February 14th, in recognition of his fifty years of service as a member of the hospital staff, according to *Science*. On this occasion his portrait, painted by Leonibel Jacobs, was unveiled by Lincoln Cromwell, president of the hospital.

Captain Cornelius A. Mahoney, of the Army Medical Corps, has been awarded the Silver Star Medal, on the recommendation of the Navy, for "conspicuous gallantry and intrepidity in action while serving as ship's surgeon aboard the U.S.S. LST 315 during the amphibious invasion of Sicily in July 1943". Captain Mahoney's home is in Forest Hills, N.Y.

Dr. Clay G. Huff, professor of parasitology at the University of Chicago, was invited to be a guest investigator of the Institute of Public Health and Tropical Diseases of Mexico City, and was granted leave from the university from March 1st to April 15th. Dr. Huff is well-known for his research in the field of malaria.

Brigadier General Hugh J. Morgan, chief consultant in medicine to the Surgeon General, has been named president-elect of the American College of Physicians.

Colonel Isidor S. Ravdin, M.C., commanding officer of the Twentieth General Hospital in India, has been appointed John Rhea Barton professor of surgery at the University of Pennsylvania School of Medicine. While Colonel Ravdin is on active duty, the Chair will continue to be held by Dr. Eldridge L. Eliason, who is retiring.

Dr. C. C. Coleman, professor of neurological surgery at the Medical College of Virginia, has been appointed one of the three civilian consultants to the Surgeon General of the Army.

Surgeon General Norman T. Kirk, U.S. Army, Brigadier General James S. Simmons, M.C., chief of the Preventive Medicine Service, and Colonel A. B. Welsh, M.C., deputy chief of the Operations Service, have returned to Washington after a six weeks' tour of the Pacific theater of operations, where they inspected all phases of medical department operation.

Major G. J. Dammin, M.C., has returned to the United States, having completed a mission in the India-Burma theater as executive officer for the Dysentery Commission of the Army Epidemiological Board. He has been assigned to direct the Division of Laboratories in the Surgeon General's Office.

Dr. Joseph T. Wearn, professor of medicine at Western Reserve University, Cleveland, has been appointed dean of the School of Medicine, succeeding Dr. T. H. Sollman, who retired last year.

Book Reviews

Metastases

Metastases. Medical and Surgical. By Malford W. Thewlis, M.D., attending specialist in general medicine, United States Public Health Hospitals, New York, N.Y. With a foreword by Hubert A. Royster, M.D. Illustrated. Charlotte, North Carolina: Charlotte Medical Press, 1944. Pp. 230. Price $5.00.

Most of us, when we hear the word "metastasis" think immediately of malignancy. This is correct, but we need also to think of "medical metastases" or transference of disease conditions, not necessarily malignant, by way of the lymph and blood streams to parts of the body remote from the site of origin.

Dr. Thewlis divides his book into sections as follows: 1, general considerations; 2, neoplasms; 3, infections; 4, infectious diseases; 5, miscellaneous diseases, and 6, regional metastases. The purpose of the book is to acquaint or re-acquaint students, general practitioners, surgeons, and roentgenologists with migratory agencies which extend disease of whatever kind to remote areas of the body. The illustrations are line drawings which show lymph nodes and their connections by lymphatic channels. Therefore, one can see at a glance just how a given lesion may extend out of bounds. On each page is an outline with headings and sub-headings something after the manner of student note-taking. However, the author recognizes that vicarious extensions also take place, and that metastasis does not always follow a definite course. But exceptions do not destroy a rule. The rule is that extensions follow, usually, the most direct anatomical route,—all other are "paradoxical".

In a work which shows such great study and research, it is a pity to find rather extensive "Córrigenda" on the flyleaf. One can only hope that a future edition will do away with such errors.

Military Neuropsychiatry

Manual of Military Neuropsychiatry. By Harry C. Solomon, M.D., professor of psychiatry, Harvard Medical School; and Paul I. Yakovlev, M.D., instructor in neurology at Harvard Medical School. With the collaboration of eleven doctors. Illustrated. Philadelphia and London: W. B. Saunders Company, 1944. Pp. 764. Price $6.00.

This is another in that excellent series of *Military Manuals* which have been issued from time to time during this war. At the outset, it is the opinion of this reviewer that it excels in readability and actual practicality any of those that precede it, and he has reviewed them all. Here we have a graphic presentation, a picture, of a soldier, in the making, when he is made, and when he must be discharged because he cannot be reclaimed. The notation is made that no man, however strong in mind and body, can undergo endlessly the rigors of war without somewhere at some time breaking down. There are limits beyond which both flesh and spirit fail. While written for medical officers and others who have to deal with men in uniform, the authors hope that this book will have more than passing value. It should remain useful for years to come to *any physician* who has to deal with psychiatric and neurological problems in or out of "service", and that means *all of us*. It is an amazing experience to find a composite book written by nearly fifty men having necessarily varying points of view, and yet so unified in the desire to analyze, diagnose, and offer constructive advice and help. The sympathetic understanding of the service man and his problems, both at the induction seat and under hardships of field conditions is phenomenal. About every type of human, normal and abnormal, is described in this volume, and yet it is not altogether objective. There is also the neuropsychiatry of the neuropsychiatrist, for he is not too different from other men. On page 481 *et seq.* there is a heading written by Major Samuel H. Kraines, Medical Corps, Army of the United States, dealing with the "Military Orientation of the Psychiatrist". There follow lectures in question and answer form and many illuminating questions make excellent reading. In short, this is a handbook which should live for many years.

Medical Mycology

Elements of Medical Mycology. By Jacob Hyams Swartz, M.D., assistant professor of dermatology, Harvard Medical School. Introduction by Fred D. Weidman, M.D., professor of dermatological research, University of Pennsylvania. New York; Grune and Stratton, 1943. Pp. 179. Price $4.50.

Swartz has produced the most useful book in English on the fascinating subject of medical mycology, which is of interest to all physicians and pathologists. True enough, it cannot replace the compendlum of Sabouraud, but that was in French and is now out of print. In this volume, the langauge is brought down to the level of the laboratory technician, hence the physician may with propriety offer it to his staff of nonmedical people. Lewis and Lewis and Hopper projected their efforts elsewhere. The studies of Hopkins, undertaken as a war service, are not yet published.

Swartz combines the laboratory and the clinic. Reproductions of organisms and the photographs of patients with skin manifestations of infestation are presented in great profusion. Nomenclature and glossary are welcome additions to a work of this high calibre. Interestingly enough, the work does not mention Fleming and his researches on penicillin, which are of such great significance.

However, the prevalence of mycotic infestations and the possibility of confusion with industrial skin insults make the need for the work of Swartz increasingly acute. The reputed epidemic of ringworm of the scalp of school children likewise increases the number of physicians required to know about the organisms.

Dermatology

Essentials of Dermatology. By Norman Tobias, M.D., senior instructor in dermatology, St. Louis University, etc. Second edition. Philadelphia, London and Montreal: J. B. Lippincott Company, 1944. Pp. 497. Price $4.75.

This brief treatise on skin diseases summarizes the current advances in practical form. The classification of the various types of dermatoses is based on the clinical, pathological and etiological concepts universally accepted. In fact, the author stresses each disease from the viewpoint of internal medicine to eliminate the notion that dermatology is a collection of Latin and Greek names descriptive of superficial aberrations. Effective therapeutic measures are formulated in a concise manner with economy of space in the book and of time to the patient. New editions bring vitamin and sulfonamide therapy up-to-date, but military dermatology has not been included. There is ample illustrative material of common disease entities.

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APRIL 1945

Medicolegal Notes

Vitamins are Food Products, Not Drugs

The New Jersey Court of Common Pleas, Board of Pharmacy v. Quackenbush and Co., 39 A. 2d 28 recently dismissed a complaint against a department store for violating a New Jersey statute by permitting the retailing and dispensing of vitamin plus capsules by a person neither a registered pharmacist or registered assistant nor under the immediate supervision of a registered pharmacist. The court's reason for dismissal was that "vitamin plus, whether called an accessory food factor or a dietary supplement, is still essentially a food product", as claimed by the defendant, and so not within the statute.

The content description of vitamin plus is marked on its cellophane-wrapped package, which the retailer merely hands over to the purchaser, who places no reliance on the skill and knowledge of this dispenser.

The terms "drug" and "medicine" are not defined in the New Jersey statute. The definitions of these terms in the Federal Food Act are not applicable to this statute, the purposes of the two statutes being different. The prescription of certain foods in the dietary treatment of disease does not, the court holds, transform the article prescribed into a medicine by the act of prescription alone. And a substance does not become a medicine as a fact merely because of the form, in this case capsules, in which it is marketed. "Vitamins, as such, are not listed in the *Pharmacopoeia;* they are elements contained in ordinary foods and are constituents of food products, apparently the fact that they are concentrated does not change their essential character".

It was conceded in the evidence that vitamin plus capsules are harmless and can have no ill effect. The purpose of the New Jersey statute is to protect the public against the sale of poisons and powerful drugs without the protection of skilled safeguards. An alternative defense of the store was that if vitamins plus should be held to be a medicine, it is in fact a nonpoisonous or proprietary medicine, and as such specifically excepted in the act.

The only recent case dealing with the problem presented in the New Jersey case appears to be Kroger Grocery and Baking Co. v. Indiana State Board of Pharmacy, decided November 6, 1939 (but with no opinion for publication), wherein it was held that vitamin capsules are necessary food factors and as such excepted from the operation of the Indiana State Drug Act.

Causal Connection

The testimony of three doctors that a workman's resistance had been lowered by arthritis following an accident, bumping his elbow against a bowl, that the accident was probably the cause of the workman's death from bronchial pneumonia, about a year later, did not meet the legal standard of proof of causal connection between the accident and death. And the death was not so immediate, direct, or the natural and probable consequence of the injury as to dispense with medical testimony establishing causal connection. A direct expression of professional opinion that lowered vitality due to an accidental injury was the principal cause of death from a germ disease is necessary to establish causal connection. Franko v. United States Sanitary Mfg. Co., Pennsylvania Superior Court, 39 A. 2d 363.

Arthritic Disability Not Compensable in New Jersey

Testimony of a doctor to whom a compensation claimant was sent for x rays, that, from the pictures, the workman's trouble was "arthritic in origin" and the lack of any objective sign of any ailment or disorder whatever, and the workman's own conduct for seven months after the date of alleged accident to his back, was held proof that, if the workman suffered from any disability, it was not the result of a compensable accident. Spitz vs. National Rubber Mfg. Co., (N.J.) 39 A 2d 170.

Successive Injuries

In determining permanent disability under the West Virginia workmen's compensation act the Commissioner, in the absence of a waiver, should take into consideration a prior nonindustrial injury suffered by the claimant, where this former injury magnifies the disability resulting from the later injury for which claim is made. Hardin v. State Compensation Commissioner, 31 S.E. 2nd 436.

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Medical Art Exhibit

As a tribute to the American medical artist, whose important part in recording advances in medicine has for the most part been unrecognized, a Medical Art Show of national scope, assembled by *Modern Medicine,* was opened at the Brooklyn Public Library, March 19th, and continued until April 7th. Twenty-six artists, representing almost as many schools of medicine and clinics, showed samples of their work as it is being used in medical journals, bulletins and manuals. While the medical artist's major work is a day-by-day recording of medical advances in the operating room, in the delivery room, or at autopsies, his contribution to war surgery is apparent in a number of illustrations.

Carl Adams, who is associated with the Walter Reed Hospital in Washington, D.C., presented a series of before-and-after drawings illustrating surgical rehabilitation of the war wounded. A fine study of the oscinid fly, a carrier of yaws, a threat to many of our fighting men in the tropics, was the work of Elizabeth Cuzzort, a Brooklyn artist with the Long Island College of Medicine. Alfred Feinberg, of the College of Physicians and Surgeons, Columbia University, exhibited a drawing of an abdominal scar. Advance proofs of a *Manual of Surgical Anatomy,* prepared under the auspices of the Committee on Surgery of the National Research Council, were shown. There were many valuable studies of the delicate tissues of the eyes, those by Annette S. Burgess, of the Wilmer Institute of Johns Hopkins Medical School, and Gladys McHugh, of the University of Chicago, and Theodora Bergsland, of Western Reserve University, Cleveland, being noteworthy. Studies of the hand by Mary Dixon, of the Department of Anatomy, Northwestern University Medical School, were important in the demonstration of reconstructive surgery.

The work of the late Max Broedel, whose teaching and art have influenced more medical artists than those of any other medical illustrator, and who was the founder of the School of Art as Applied to Medicine at Johns Hopkins Medical School, was a loan from his daughter, Elizabeth Broedel, staff artist with the Woman's Clinic of the New York Hospital.

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BACTERIOSTATIC DETERGENT

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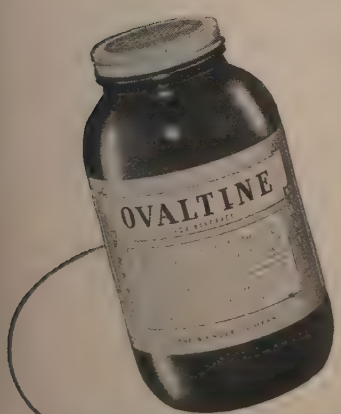
WHEN NUTRITION MUST BE MAINTAINED

Few are the diseases in which maintenance of the nutritional state is less important than specific therapy. For unless the metabolic demands are adequately satisfied, maximal response to drug administration hardly can be expected.

In a host of febrile, infectious, and neoplastic diseases Ovaltine can be of considerable benefit in supplying the extra nutrients required during periods of greater need. This nutritious food drink, made with milk, supplies the dietary elements required: adequate protein, readily assimilated carbohydrate, B complex and other vitamins, as well as important minerals. Ovaltine leaves the stomach rapidly because of its low curd tension, hence may be taken as frequently as deemed necessary. And its delicious taste encourages adequate consumption, an important factor in combating the anorexia of many diseases.

THE WANDER COMPANY, 360 NORTH MICHIGAN AVENUE, CHICAGO 1, ILLINOIS



Ovaltine

Three daily servings of Ovaltine, each made of ½ oz. Ovaltine and 8 oz. of whole milk,* provide:

PROTEIN	31.2 Gm.	VITAMIN A	2953 I.U.
CARBOHYDRATE	62.43 Gm.	VITAMIN D	480 I.U.
FAT	29.34 Gm.	THIAMINE	1.296 mg.
CALCIUM	1.104 Gm.	RIBOFLAVIN	1.278 mg.
PHOSPHORUS	903 Gm.	NIACIN	7.0 mg.
IRON	11.94 mg.	COPPER	.5 mg.

*Based on average reported values for milk.

Tetanus

Leslie Cole, M.D., Cambridge (*British Medical Journal*, February 17, 1945) reports two cases of tetanus, one an interesting example of severe local tetanus developing during a mild generalized attack and the other an example of severe tetanus. The author says that local tetanus occurs in mild cases most frequently after prophylactic antitoxin has been given and usually the local signs occur in the injured limb before generalized symptoms appear. In head wounds, paralysis or spasm of cranial nerves is another manifestation of local tetanus, and is an important warning that generalized tetanus will almost certainly develop. Some workers have suggested that local tetanus is caused by a toxin absorbed from the wound affecting the motor nerve endings locally before a toxin carried around in the blood stream has had time to produce its effect on the motor nerves generally or to involve the synapses in the brain and spinal cord.

In the case of local tetanus reported, the signs in the wounded limb were slight when the signs of generalized tetanus were marked. The local tetanus developed to an intense degree only after antitoxin had been given, persisting throughout the whole illness and even longer than the signs of tetanus in other parts of the body. The author points out that local tetanus of the type described in this case probably occurs without any detectable signs or symptoms of generalized tetanus later. The second case reported was an example of severe tetanus with a period of onset of not more than thirty-six hours, and the progress of the diseases suggested a bad prognosis. Three measures which proved helpful in the treatment were: 1, intramuscular paraldehyde to control reflex convulsions and promote sleep; 2, a plaster-of-Paris bandage to keep the needle of the intravenous drip in the vein during the period when convulsions were frequent and severe; 3, the early administration of sulphathiazole when the possibility of lung infection was threatening.

Self-Treatment of Colds

According to a nation-wide survey conducted by the National Opinion Research Center, University of Denver, for the Physicians' Committee on Research, Inc., the vast majority of Americans are at least occasionally afflicted with the general discomforts of a cold. It was found that seventy percent of the people of the United States treat their own colds; eight percent see a doctor immediately, six percent try self-treatment first and then see a doctor if necessary, and two percent said they never had a cold. About one person in eight, thirteen percent, said he did nothing, but just let his cold run its course.

Many of those persons who treat themselves prefer "good old-fashioned home remedies." They drink plenty of water, fruit juices, soda and water, or hot lemonade; they take laxatives; they go to bed; they rub their chests with grease or use mustard plasters. Some recommend such homely cures as honey and onions, turpentine, or coal oil. About an equal number like patent medicines, commercial products; every brand has its adherents. A few prefer whiskey; still others have a favorite prescription. A number of persons said they used a combination of different self-treatments.

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relieves the various vasomotor and nervous disturbances so frequent at the menopausal period, with uniformly good results.

Pasadyne acts promptly and without undesirable by-effects.

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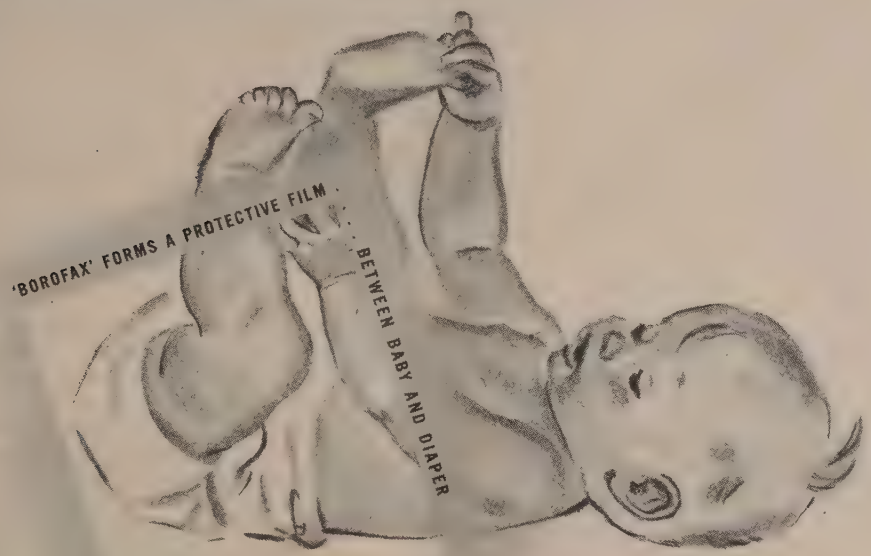
Diaper rash protection



Dermatologists and pediatricians have learned one thing from industry—the efficacy of protective ointments in preventing industrial dermatitis. By applying a protective ointment *before* contact with irritating substances, the worker has been able to prevent disabling dermatoses.

The same plan is effective in avoiding *diaper rash.* If baby's buttocks are anointed with 'Borofax' borated ointment at each diaper change, irritation from soiled, urine-soaked diapers will be largely avoided and danger of infection lessened.

'Borofax', containing 10% boric acid in a bland emollient base, is highly effective in relieving the discomfort of an already established skin irritation.

Issued in collapsible tubes of ¾ and 1¾ ounces.

'Borofax' reg. trademark

Ideal for baby's tender skin **Borofax**
BORATED OINTMENT

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Air Express Transportation of Medical Supplies

The long history of man's effort to conquer disease, subdue pain and fend off destructive plagues has added a dramatic chapter with the growing international traffic in medical, pharmaceutical and dental supplies via air express. As the swiftest form of modern transportation, air express was afforded numerous instances in 1944 to prove its emergency value in rushing drugs and vital equipment to countries outside our borders. A number of significant instances have been compiled by the Air Express Division of Railway Express Agency and they follow:

In April 1944, Guatemala City was struck by typhus fever. Vital shipments of medicine and DDT insecticide, flown to the affected area from this country, helped check and turn back the progress of the disease.

Some time ago, a rancher in Guatemala received by air express enough antianthrax serum to save a large herd of cattle. About ten thousand cubic centimeters of the serum were sent from New Jersey; place of its manufacture, by domestic airline first and then via international air express to its destination.

In September 1944, 125 cc. of hog cholera virus vaccine were rushed to Haiti by plane as an emergency shipment. Requiring constant refrigeration, the extremely perishable cargo could not have withstood a slower trip by water. Later on in November, another rush shipment of vaccine was flown to Bolivia after several bubonic plague cases had been reported. Sufficient quantity of the vaccine was sent to immunize three hundred persons.

European regions are also receiving quantities of drugs, hospital equipment and laboratory material by air express. Surgical instruments, x ray tubes, whole blood and blood plasma form a substantial part of the international air traffic during the past few war years.

Recently, the American Red Cross sent, by air express, five thousand tubes of penicillin to Geneva for the treatment of American prisoners of war. The largest single shipment of drugs, forwarded by international air express last year, weighed twenty thousand pounds and was flown to South America at the rate of three miles a minute.

Pest-destroying insects and white mice used for experimental purposes are continually being shipped as air express cargo. Department of Agriculture entomologists recently flew two thousand parasitized coddling moths to their colleagues at Lima, Peru. California insectaries ship between forty and fifty million insects by plane each year to various parts of the world.

Dental supplies are moving in ever-larger volume by air express. About fifteen hundred sets of false teeth are flown each month by one airline to South and Central American countries.

Not all the medical traffic flies out of the country. Numerous cases of emergency imports by air express are helping to bind more closely together the northern and southern nations of the American continent.

Through its twenty-three thousand offices, the Railway Express Agency, expects to handle increasing amounts of medical and pharmaceutical material Domestically, the Agency serves 728 air express offices including 375 airport cities, a number of which are points of international traffic.

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Will Thank You, Doctor

When the aging process interferes with appetite, nutrition is often inadequate. GRAY'S COMPOUND, a "bitter tonic," helps to improve appetite, digestion and assimilation and thus aids in bringing about better nutrition. GRAY'S COMPOUND goes hand in hand with the special therapy, which your aged patients may require.

GRAY'S COMPOUND

is a palatable preparation of Extracts of Gentian and Dandelion. Wine, Glycerine, Phosphoric Acid, Tr. Cardamon Comp. and aromatic elixir syrup. Indicated in treating CONVALESCENTS, the RUN-DOWN, LISTLESS CHILDREN, and the OVERWORKED.

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TRUSHAY, applied *before* washing, forms an invisible film which helps guard against the harsh effects of cleansing agents . . . helps protect hands by aiding to keep skin healthy and unbroken!

TRUSHAY does not cause unnatural stickiness

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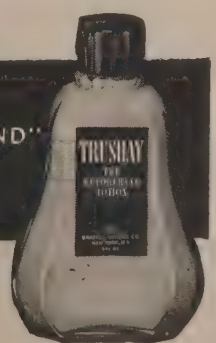

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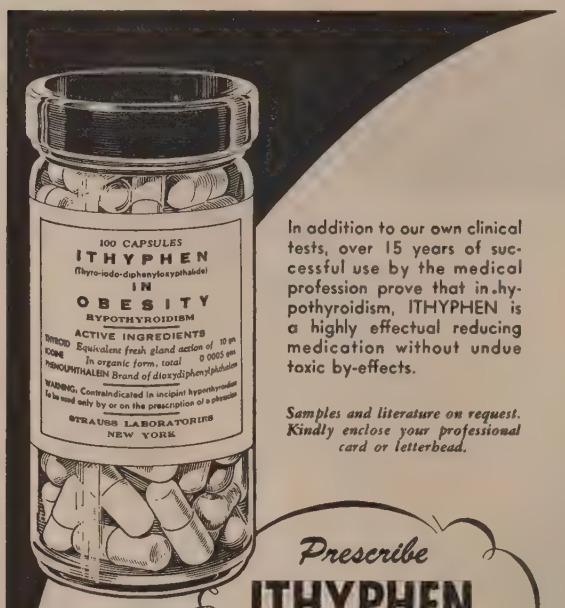

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Speech Rehabilitation Clinic

Soldiers returning from war service with organic and psychological disabilities affecting their speech or their oral communication with others are receiving remedial training in speech at the University of Illinois Speech Clinic.

The clinic has operated for several years with a two-fold purpose of providing speech rehabilitation for University students and of providing a training laboratory for students who wish to prepare themselves as correctionists. The clinic now is extending its service to include returning veterans who have become mute, hard-of-hearing, dysphonic, aphasic, or dysphemic. Furthermore, students who have trained or are in training in the clinic are going out to veterans' hospitals and rehabilitation centers to aid in speech reeducation of those soldiers needing such help.

Another new demand upon the clinic results from recent state legislation encouraging the public schools of Illinois to assist children in speech rehabilitation. Speech disorders, including speech defects associated with spastic paralysis, cleft palate, hearing deficiencies, dental anomalies, personality adjustment, glandular disturbances, and delayed speech, as well as functional defects, are studied by clinical students.

The students are given training in the use of special clinical equipment for the diagnosis and treatment of various defects. Such equipment includes the audiometer, breath control devices, motion pictures, the mirrophone and other aids. To insure adequate training in the clinical treatment of speech defects, students take correlated studies in psychology, sociology, physiology, physics, and neurology.

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ORGANIDIN is absorbed readily from the gastro-intestinal tract, with less irritation and less toxicity than is produced by elementary iodine. Thus it permits a maximum effect with a minimum iodine dose.

A superior product which may be administered over an extended period of time with little probability of causing gastro-intestinal disturbances or iodism.

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Multiple Factors in the Etiology of Cancer

John A. Ryle (*The Lancet*, July 11, 1942) makes a plea for wider concepts and a new study of the etiology of disease. The discovery of specific microbic agents of disease, he said, and the recognition of specific chemical agents and specific deficiencies have, until quite recently, and contemporaneously with their immense benefits to medicine, had a peculiarly limiting effect upon the vision and the practice of many medical men, not excluding teachers. They have, in fact, compelled a neglect of the associated causal factors without which no disease can have its being. They have also fostered a belief in or search for single causes where none exist.

In regard to cancer he said whatever new knowledge may emerge from the various intensive studies so long and so patiently pursued in so many laboratories it appears probable (alike to its clinical observers and its experimental students) that this disease too must come to be classified among those dependent upon variable "multiple factors". Herein reside some of its chief difficulties. In all the more chronic types of disease—whether infective or neoplastic—it would seem that the several factors concerned possess a much more equivalent influence than is usually the case with the acute diseases.

It is known that in most cases of cancer age, sex and chronic irritation affecting certain organs or tissues are etiological factors which cannot be disregarded. It may even be suggested as likely that age and chronic irritation (through waning tissue activity) and sex (through changing hormonal balance) will be found to play a part as determining factors.

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HYPERTENSIVE HEART

CACODYNE special iodine and cacodylate furnish glandular nutritional sustenance for sustained cardiovascular relief in hypertension, angina pectoris and allied conditions. Minimized arterial occlusion, cellular exudate and cholesterol deposit improve coronary and general circulation. Hundreds have shown improvement upon administration of . . .

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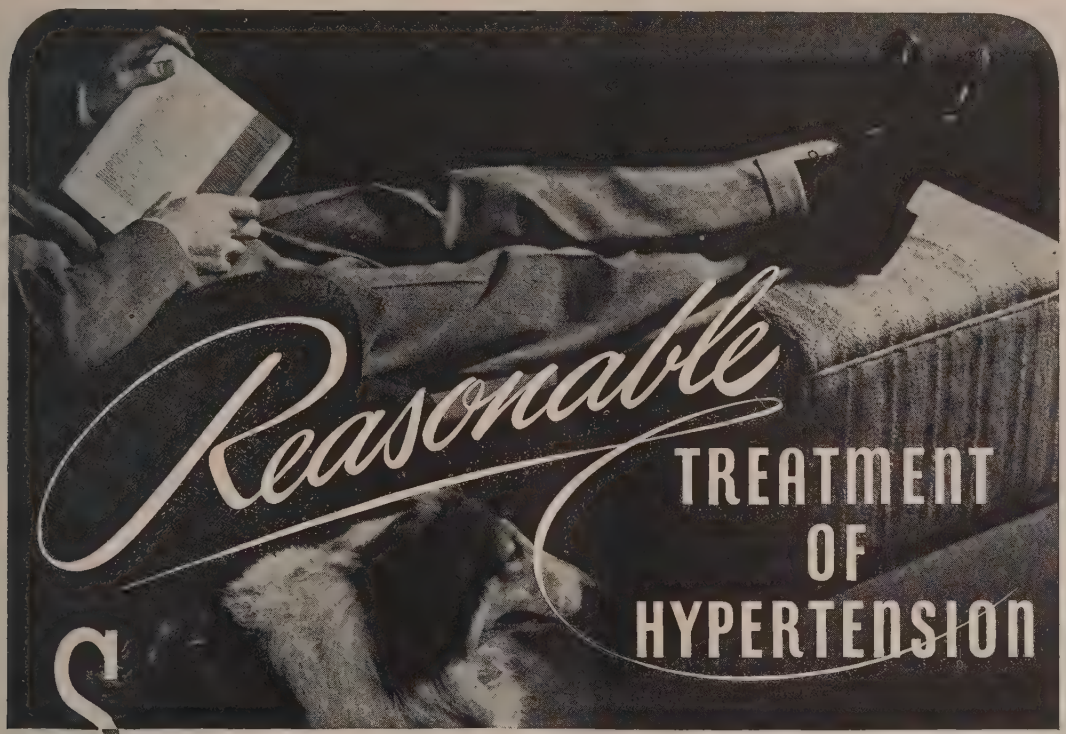

Successful management of high blood pressure calls for a regimen which is adjusted to individual requirements. Physical activity is generally curtailed and overwork is avoided. In certain circumstances special diets are prescribed and the use of stimulants is restricted.

These measures are often supplemented with the administration of Theominal. This combined vasodilator and sedative aids in reducing blood pressure to a more normal level. As a consequence hypertensive symptoms are relieved and the risk of complications is reduced.

DOSAGE: The customary dose of Theominal is 1 tablet two or three times daily; when improvement sets in the dose may be reduced. Each tablet contains theobromine 5 grains and Luminal* ½ grain.

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Associated Hospital Service

The annual report of the Associated Hospital Service of New York, published on March 13th, shows admitted assets of $13,607,192.20, as of December 31, 1944, a gain of $2,122,121.38 over the preceding twelve months' period. A total of 144,130 bills amounting to $9,582,333.39 was paid to hospitals on behalf of subscribers for the treatment of more than fifteen hundred different kinds of illness, bringing the total of payments to hospitals since the service was first put into effect in May 1935 to $55,903,112.23.

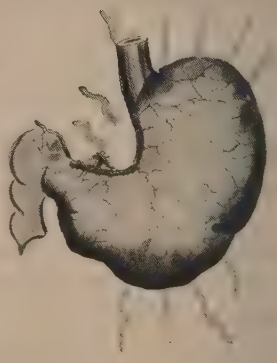
The report contains a statement of the year's increase in enrollment which broke all previous records and brought the overall total of subscribers to 1,804,127. New subscribers numbered 360,380, an increase of 218 percent over the previous year's enrollment gain.

The year's outstanding accomplishments are listed in the report as the addition of penicillin to the benefits; permanent adoption of a special dividend providing subscribers with the use of operating rooms, x rays, and laboratory examinations without money limitations; a new contract enabling persons who cannot afford semi-private accommodations to receive ward service; the lifting of restrictions on individual enrollment during a limited period; the adoption of special dividends making benefits available to subscribers for each illness instead of for each year, and the granting of an allowance to subscribers needing operating room service but who do not become bed patients; and the placement of the organization's sales, educational, and administrative facilities at the disposal of United Medical Service, Inc., "the doctors' plan" for prepaying medical and surgical expenses.

CHRONIC GASTRITIS

This catarrhal inflammation of the gastric mucosa is associated with deranged digestion, increased mucus formation and changes in the gastric juice. A well-planned diet rich in vitamins is considered to be an important therapeutic measure. In many cases dietary regulation is the most important therapy. In some cases foci of infection must be eliminated.

Medication, however, is often of much value in conjunction with diet therapy, especially if deficiency states are suspected. In these cases gastric enzyme replacement therapy should be tried. Gastron either plain or with Iron may be given by mouth. The latter preparation which presents all the elements of normal gastric juice, plus organic iron, is palatable and well tolerated.



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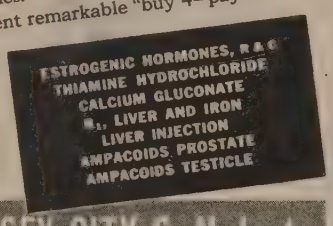

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Pyrethrum Cultivation

With one of the largest pyrethrum crops in the history of Kenya Colony, East Africa, now being released into war channels, plans are under way for more intensive peace-time cultivation of the daisy-type flower which is the source of the pyrethrins, base of most of the effective pre-war insecticides made in America, according to an announcement by George E. Nixon, on behalf of the Kenya Farmer's Association Co-operative, Ltd. Mr. Nixon said that except for a small amount not suitable for war use, the entire Kenya output of pyrethrum had been taken over by the military authorities. Under the stimulus of the British Ministry of Supply which had contracted for the entire crop of the Kenya farmers, more than fifty thousand acres were now under cultivation, he said, and vast tracts of additional East African acreage were available for future plantings. It is no secret that before the War the Kenya pyrethrum farms had produced, annually, as much as fourteen million pounds of the flowers containing the poison which is the deadliest known enemy to most forms of insect life but which is harmless to human beings and to warm-blooded animals.

Discussing possible post-war competition from Japanese farmers, Mr. Nixon stated that it had been established that the pyrethrum flowers grown in Kenya not only contain fifty percent more pyrethrin content than their Oriental counterparts, but the East African perpetual summer climate produced more or less continuous harvests as compared with a single Japanese harvest. Mr. Nixon emphasized that since freshness was an important consideration with pyrethrum, the Kenya product offered this additional strategic advantage.

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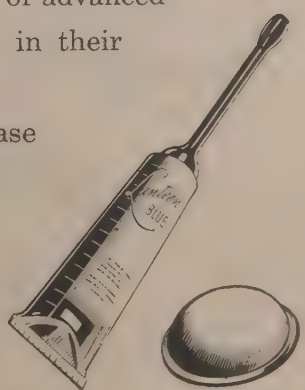

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Progress in Child Health

The past two decades have witnessed an extraordinary reduction in the general mortality among children of elementary school age, says the *Statistical Bulletin* of the Metropolitan Life Insurance Company. Among children five to fourteen years of age, insured in the Industrial Department of the Company, the death rate from all causes combined was cut sixty-five percent between 1922-1923 and 1942-1943.

As regards individual causes, the most spectacular gains were scored against the principal communicable diseases of childhood, which showed a reduction of no less than ninety-three percent in the past twenty years for the children of grade school age. The largest decrease was reported for diphtheria, the death rate from this disease among the insured children of elementary school age now being one-twenty-sixth of what it was two decades ago. Notable progress has also been made with regard to the other three diseases in this group, the decreases in mortality during the period amounting to nearly ninety percent for scarlet fever and eighty percent for both whooping cough and measles. The death rates from tuberculosis and pneumonia were reduced among children by fully three-fourths in twenty years, and there was also a decrease of seventy percent in the mortality from appendicitis. Rheumatic fever and organic heart disease recorded a drop of three-fifths in mortality over the twenty-year period. The death rate from accidents among children of elementary school age was cut almost in half in the past twenty years. Automobile accidents decreased fifty-two percent, mortality from accidental falls was reduced fifty percent, and the death rate from burns and scalds was decreased seventy per cent.

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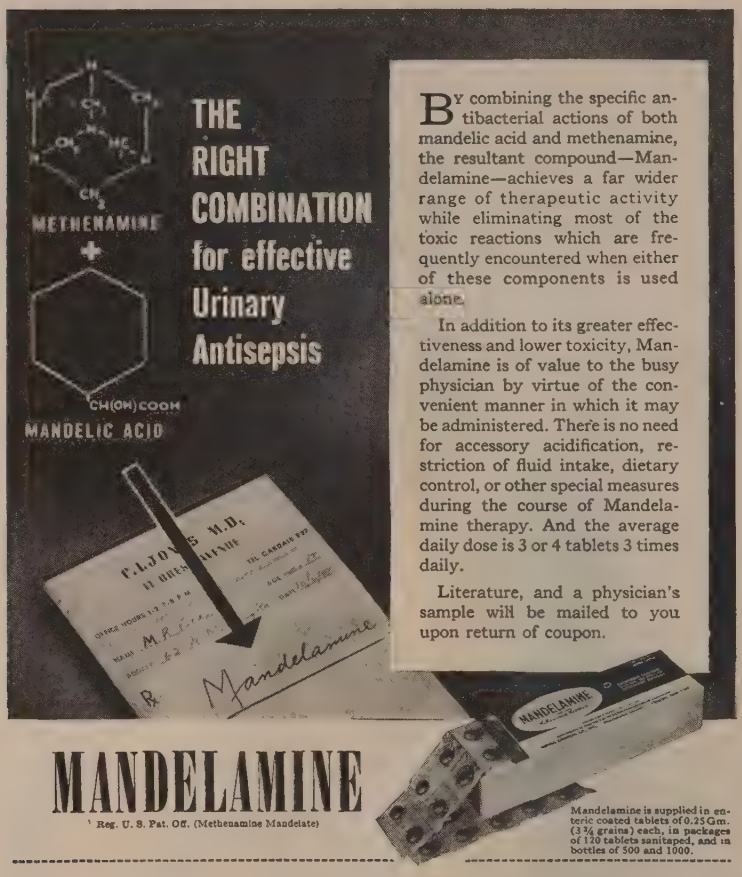
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Penicillin Treatment of Pneumonia in Early Infancy

Angus McBride (*Amer. Jour. Dis. Children,* October 1944) reports two case of pneumonia due to Staphylococcus aureus hemolyticus in infants aged four and five weeks respectively. These patients were given sulfadiazine in adequate dosage for forty-eight hours, but their condition became worse. Penicillin therapy was started at this time and though the use of sulfadiazine was continued, the dramatic improvement after penicillin was administered seemed to be due to that agent. The total amount of penicillin given the two infants was 41,000 and 50,000 units respectively. In the second case a total of 50,000 units of penicillin was given over a period of three days. The infant became edematous and two injections of plasma were needed. Improvement was noted twenty-four hours after penicillin was begun and after three days the patient was out of danger.

Infection caused by pneumococci and by beta hemolytic streptococci usually responds readily to adequate therapy with a sulfonamide compound. Staphylococci are much more resistant to sulfonamide compounds, and death often occurs in a few days even when adequate doses of one of these drugs have been administered. The author believes that young infants with bronchopneumonia who do not make a quick response to such therapy should be treated with penicillin without delay. Cultures should be made, but treatment with penicillin should be started at once without waiting for the laboratory report.

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War Office of Psychiatric Social Work to be Retained

The continuance of the War Office of Psychiatric Social Work, as an aid to the mental health and rehabilitation of servicemen, has been announced by Dr. George S. Stevenson, medical director of the National Committee for Mental Hygiene. This is a joint project of the National Committee for Mental Hygiene and the American Association of Psychiatric Social Workers and performs a valuable liaison function between psychiatric social work and the armed services. The work has proved such a valuable resource to Selective Service and to the mental health services of the armed forces that a proposed discontinuance of the War Office has been averted by securing additional financing, and the work will continue through 1945. Mrs. Elizabeth H. Ross, secretary of the War Service Office of the Association, has been appointed a consultant to the Surgeon General of the Army, bringing a more direct relationship between psychiatric social workers and the Army, through the Division of Consultants in neuropsychiatry.

Both neuropsychiatry and psychiatric social work have been utilized as important resources in the Army as they have also been in Selective Service. The Army has established services in conjunction with military psychiatry in station, general and neuropsychiatric hospitals, in consultation services in rehabilitation centers, in convalescent and reconditioning facilities and in redistribution centers. The Army is using its own enlisted personnel in conjunction with psychiatry.

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Medical and Surgical Relief

The report of the treasurer of the Medical and Surgical Relief Committee of America shows that during the six months period ending Dec. 31, 1944, the Committee's donations to twenty-one countries, including the United States, amounted to $43, 669.87. The territory covered by the Medical and Surgical Relief Committee has increased as the number of liberated countries has increased, and contributions now reach France and Italy. United States tops the list of beneficiaries with $16,386.48 worth of medical, surgical and dental supplies of which the Navy got $3,542.13, the Army $1,025.40, and various civilian hospitals and welfare agencies the balance of $11,818.95. The greatest number of shipments for this period went to China and India, while the most valuable single contributions, amounting to $4,951.76 went to *L'Entre Aide Francaise* for the relief of French children.

New Penicillin Container

The Wyeth Laboratories have developed a new container for penicillin which protects the potency of the drug for long periods of time. This new container is called a "vipule", and is described as combining the features of the vial and the ampule. One vipule contains one hundred thousand Oxford units of penicillin and a second a sterile salt solution. An ingenious method of transferring the salt solution to the dry, porous penicillin insures the preparation of a sterile penicillin solution without exposure, which is said to be impossible when a syringe is used in the ordinary way.

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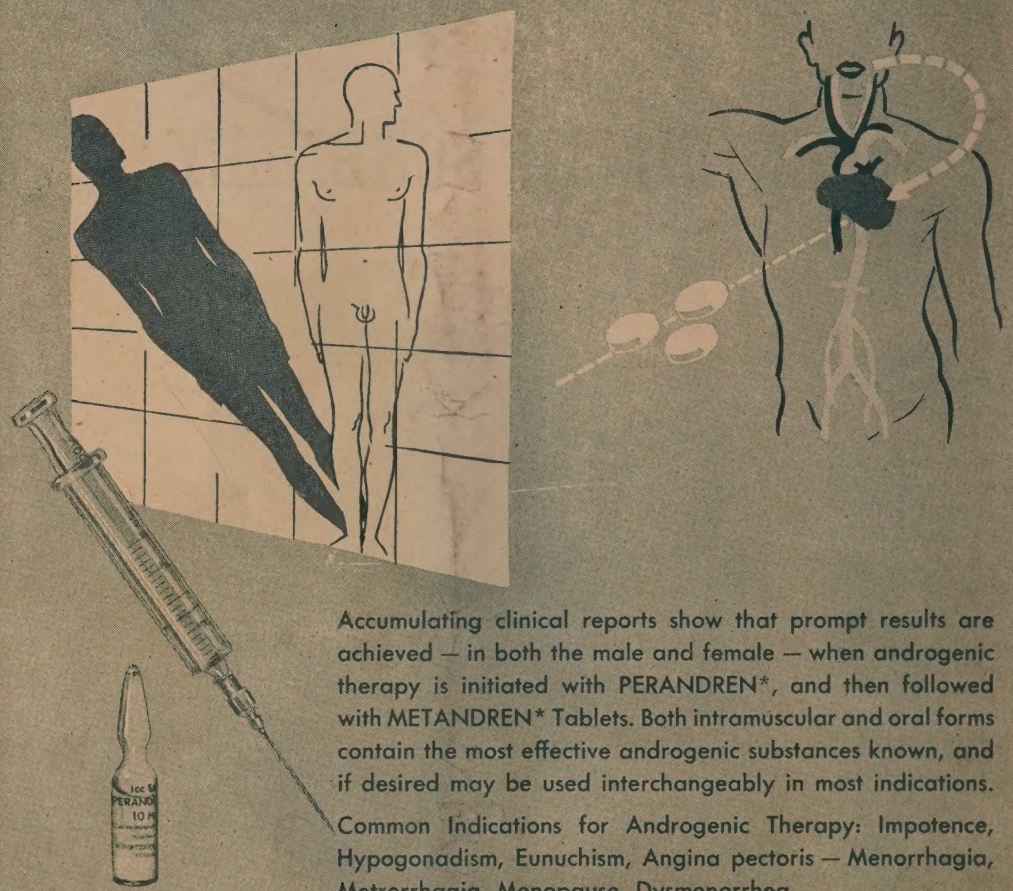

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